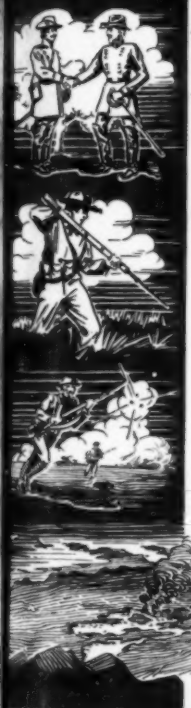
JANUARY
1942

Industrial FINISHING

Published Monthly in the Interest of Modern Production Finishing



WAR

IS NOT NEW TO US—

In fact we are a war baby. The Lilly Varnish Company was founded in 1865 . . . seventy-seven years ago. We have survived two wars since, the Spanish and World War No. 1 . . . and we propose to survive this one. Our three research units located at Indianapolis, High Point, N. C., and Gardner, Mass., will do their utmost during the present emergency to "Keep YOUR finishing needs rolling."

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Indianapolis, Indiana
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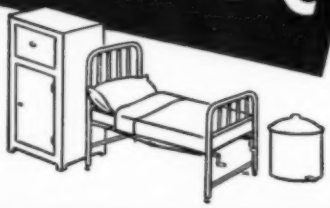
USE
ROXYN-C



Here's a hard, porcelain smooth, finish that sets ne standards for sanitary cleanliness and withstan repeated scalding and chemical sterilization wi out losing its bright "hospital-clean" appearanc

WHAT'S MORE—

1. It requires no primer and bakes in a few mi utes time in infra-red or conventional ove
2. It sets up, dust free, almost as quickly as lacqu
3. It is non-thermoplastic—will not resoften un heat—may be handled fresh from the oven wi out printing or injury to the film.
4. It is grease, alcohol and solvent proof.

Write us about your 1942 requirements.

ROXALIN FLEXIBLE LACQUER CO., IN
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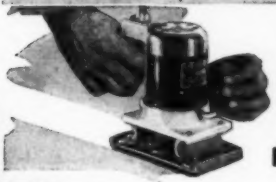
ROXALIN *Flexible* FINISHES

FOR YOUR DEFENSE

AGAINST WASTE OF TIME, LABOR AND MATERIALS – USE THE

Easy

RECIPROCATING ELECTRIC SANDER



Sanding "Alclad" before welding.

Sanding plywood wings and stabilizers.

HUNDREDS OF APPLICATIONS

The saving of Time, Labor and Abrasives in your finishing operations is vital. Don't let slow, expensive hand methods slow down production. Put the "Easy" on the job in your plant. Cut costs up to 80%—do better work, three times faster, with inexperienced labor. Industry's leaders are using the "Easy" to insure speed and close tolerances for every finishing application on metal, wood, plastic, composition and other surfaces.

ery application—from white wood to final coat.

MAIL TODAY

the attached Post Card for Information on How to

SAVE DOLLARS THE "EASY" WAY

Easy to operate—Young Americ approves modern equipment.

Saves up to 70% sanding filler coat.

Precision work—finishing stringed musical instruments.

Saves this company 8 hours on each coach.

DETROIT SURFACING MACHINE COMPANY

7434 West Davison — Detroit, Michigan

Zaponoid has good appearance, excellent durability. Light enough for maple furniture and suitable for mahogany, walnut and other veneers.

ZAPONOID

The New ZAPON Defense Wood Finish Replaces Unavailable Lacquer

Due to decreased supplies of certain critical materials necessary for its manufacture, lacquer is on its way out. Zapon Laboratories, swinging into high gear on a project that has been in work for several years, brings you Zaponoid to take lacquer's place. The new Zapon defense wood finish may relieve you of the necessity of going back to old varnish formulas or to boiled oil treatment and provides a satisfactory, well formulated finish.

Zaponoid has high solids, meets most lacquer production schedules, contains minimum of defense raw materials, stands cold check tests well and has many other good points. Write for descriptive folder, also tell us your present methods, materials and schedules. When in Chicago, visit the Zapon exhibit, Room 1802, Furniture Mart, where furniture finished with Zaponoid is on display.

Zaponoid—Trade Mark

ZAPON

ZAPON DIVISION · ATLAS POWDER COMPANY

Eastern Sales: Stamford, Conn. *Western Sales:* North Chicago, Ill.

INDUSTRIAL FINISHES

Defense & Review Section Beginning Page 18

Industrial FINISHING

Reg. U. S. Pat. Office

Published Monthly in the Interest of Modern Production Finishing

Vol. XVIII, No. 3 **JANUARY, 1942** **$2.00 a Year**

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Letters from Readers...

OF INDUSTRIAL FINISHING

These letters (and many others) were answered recently by the editorial department, but are published here to reveal certain interesting trends of desire and activity in the industry, and to encourage additional inquiries, comments and suggestions. Further information about any of them can be obtained by writing this office.—Editor.

"Remember Pearl Harbor"

A suggestion for your front cover of the January issue: "Remember Pearl Harbor."

Our self-preservation demands that our first, last and only conception and purpose is to win this war. Victory should be our watchword and the basis of every plan and every act. With this kept constantly uppermost in the minds of each and everyone of us, high and low, we then can cease worrying about our casual disappointments and move on to Victory.—A. J. Beecher.

Blackboard Paint

Do you know whether or not there is a product, such as a brushing paint, that might be applied on Masonite to give the effect of slate for ultimate use as a blackboard?

In making one recently I applied, on the Masonite, a baking primer followed by a topcoat of a flat black U. F. enamel, but this surface is not entirely satisfactory for use as a blackboard, since the enamel surface is too slick and the chalk becomes glazed and does not powder enough to leave really legible writing on the board.

I shall be interested in finding out where I may obtain about one pint of such a brushing air-dry material and would also like to know if satisfactory results from an adhesion standpoint are possible if brushed over a U. F. enamel.—T. F.

SHELLAC ENAMEL

Made in gloss or flat. Has nearly twice solid content of lacquer — same drying speed. Excellent adhesion to all surfaces. Eliminates bleeding. Flat makes excellent base for lacquer or other enamels. Can be tinted any color. Write for sample and information.

M. L. Campbell Company

706 East 19th St. Kansas City, Mo.

Revise Some Specifications

Why should not common sense be used in working out specifications for finishing materials in our national defense program? Why should broadcloth quality be required in a job of trench digging when a denim quality will give equal service for the job? The potential savings in initial expense are tremendous, but this is infinitesimal when compared to the benefits that will result through the release of broadcloth quality products for civilian use, and the attendant employment made possible in industry by common-sense specifications.

To illustrate: Why should it be required that army trucks, tanks and motorized equipment be finished with synthetic vehicles (of which there is great scarcity due to these specifications) when organic vehicles will do an equally good job for the purpose in hand?

Much of this equipment is destroyed in service and what survives will require refinishing for peace time serv-

Apologies *in* Advance

WE CAN SEE it coming—the time when "normal business" will be seriously curtailed because of raw material shortages in our own lines. If you are doing Defense Work on which our materials are being used, please notify us at once and take steps to have your priorities extended to cover such items AT ONCE.

We urge all regular users to anticipate their normal first-quarter needs and give specific quantities and shipping dates IMMEDIATELY. All such orders will be filled in their relative proportion to the percent of materials we receive.

V. J. DOLAN & COMPANY, INC.

Mnfrs. of "Unquestionable Quality" Industrial Finishes

1830 N. LARAMIE AVE. CHICAGO, ILLINOIS

Do You

Air Dry or Force Dry?

Perfection Synthetic Flat Finishes will do both. Air dry overnight or force dry in 1½ hours at 140°.

Panels coated with Perfection Flat Varnish can be immersed in water for 30 days without turning white or showing any other ill effects. Write us and we'll send panels and samples—and also a panel in water for 30-day immersion test.

PERFECTION FLAT FINISHES contain no stearates or other flattening agents. They are made 100% from gum, hence are as clear as gloss varnish—entirely free from milky appearance of conventional flat varnish.

Also, PERFECTION SEALER VARNISH covers 65% more surface than lacquer sealers—try them today.

PERFECTION PAINT & COLOR CO.

Indianapolis, Indiana

for Defense Finishing use

UNITED'S DEFENDER LINE

Defense products often require specially formulated protective coatings to meet the exacting conditions of wear, tear and abuse which they will receive in actual use. United's chemists have developed the DEFENDER LINE of protective coatings to meet the extraordinary specifications and requirements of defense products. If you have a production finishing problem on priority rated products you will find a quick solution among UNITED'S DEFENDER Line of protective coatings.

Send us your specifications and requirements—working samples and complete information will be sent promptly.

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THINNERS
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METALIZED FINISHES
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UNITED LACQUER MFG. CORP.
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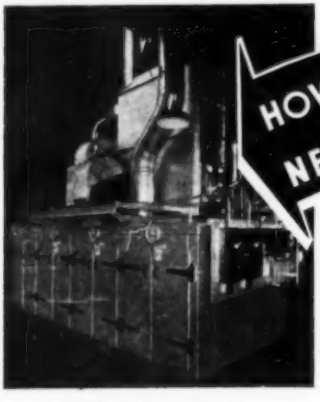


Phone, wire or write for additional information

HOW SOON DO YOU NEED AN OVEN?

GKS is prepared to handle RUSH orders for standardized ovens for baking finishes and also for humidity controlled ovens used in connection with wood finishing. Standardization of GKS ovens means more than just faster delivery . . . It provides an oven of proven dependability at lower cost and with maximum operating efficiency. GKS ovens are sufficiently flexible to meet practically every requirement.

GEORGE KOCH SONS, INC. EVANSVILLE INDIANA

ice. Then the quality products may be used without excessive expense or unnecessary interruption of normal industry.

I think this is one place where certain experts in charge of National Defense activities slipped up. Civilian activities can be preserved and industry can be protected for the future, simply by the exercise of careful thinking based upon expert knowledge of materials and requirements.—A. J. B.

Sprayed Coating to Look Like Plated Finish

We would appreciate some information on a sprayed finish that will take the place of plated finishes. Any information, such as names of various companies, whom you think might be able to help us in this instance will be greatly appreciated.—T. M. Co. (Metal Caskets and Casket Hardware).

Information supplied.—Ed.

Porcelain Enamel Repair; Aluminum Substitute

We have noted the interest of some of your readers in the following items:

1) Repair chipped porcelain enamel.

2) Substitute for aluminum powder.

We are also interested in these and we would like to have some more information on them.—Y. Lamp Mfg. Corp.

Information given.—Ed.

Sanding-Rubbing Machines

Please send us your free illustrated bulletin showing and describing Sundstrand portable sanding and rubbing machines.—W. N. & Fixture Corp.

We have notified Sundstrand to send you what you request.—Ed.

Can you give us the names of firms who make air or electric-operated machines for rubbing and polishing furniture?—G. Mfg. Co. (Quality Furniture since 1891).

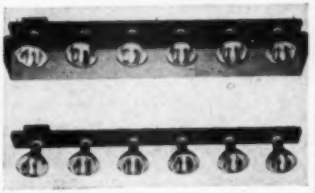
Wood Graining

We understand there is a concern in Cleveland manufacturing a reproduction of wood finishes in transfer form and sold under the trade name of "Dinoc." If you know of such a

PORTABLE INFRA-RED DRYING UNITS

Fully adjustable to all angles—from floor level to 5-ft. Longer stems can be furnished. Bases are cast iron of ample size to prevent tip over and are equipped with ball bearing casters. Temperatures range from 400° F. at 3-in. from the work to 250° F. at a distance of 18-in. In 14 to 24-gauge sheet metal.

INFRA-RED STRIPS FOR QUICK DRYING



Designed for use with R40 internal reflector drying lamps. Available in various lengths and lamp spacings to meet individual specifications for heat requirements governing any area to be heated or baked. We have a number of these in plants that are concentrating on DEFENSE WORK.

OP-AL Electric & Mfg. Co.
INDIANAPOLIS INDIANA

1-9-4-?

Some year the war will end.

Swords will be beaten into plowshares, and golf clubs and refrigerators.

There will be a swing back into the things we buy because we like them and not because they are a grim necessity.

You are planning these things now, or should be. Let us plan with you toward the finish for 194?, whenever it is.

We welcome any call for cooperation on long-range planning for the finish of the future.

Meantime, for 1942 and as far as we can see, we shall do our utmost to supply our customers with the best available materials and service permitted by wartime conditions.

The Varnish Products Company

5208 HARVARD AVENUE

CLEVELAND, OHIO

concern in Cleveland or anywhere else, please be kind enough to let us have their name and address.—L. M. Co. (Fluorescent Lighting Fixtures).

The name and address of the company you have in mind is Di-Noc Mfg. Co., 1700 London Road, Cleveland, Ohio.—ED.

Shellac vs. Sealers

I have read with interest the controversy that appeared in recent issues of INDUSTRIAL FINISHING (Sept. and Nov., 1941) between an exponent of lacquer sealers on one side and shellac on the other. Being entirely neutral, I voice my opinion as to the merits or demerits of the claims as made by either side.

There is no doubt but that both materials have certain merits and have a place in industrial finishing. One may be lower in initial cost and still fulfill its requirements as to economical results, whereas the other may produce a more substantial base or background for the final coatings.

As a suction stopper or pore filler, both may be equal and cover their claims, but I doubt that one will be more penetrative than the other. There is undoubtedly a difference between the two as to their adhesive qualities, toughness and abrasive resistance. There may also be a slight difference as to time of drying and being ready for sanding and finish coatings. One may also be somewhat superior to the other as to hiding power or eliminating defects such as stains, sap in wood, etc.

It would be entirely up to the expert finisher to check on all claims and detect the advantages of either one, as to cost of material, not by the gallon, but by the square footage and the final results, so "Let the best man win."—Geo. Whigelt, Technical Editor, National Painters Magazine.

Organic Solvents

Please favor me with a copy of reprint "Organic Solvents" by Willard Seeman (INDUSTRIAL FINISHING, Nov. 1941). Thank you.—M. M.

EDITOR'S NOTE: We are frequently asked to supply reprints of valuable articles published in INDUSTRIAL FINISHING magazine. We make no reprints of articles unless same are specifically ordered in quantities of say 500 or more. Immediately after an issue of the magazine has been completed ready for mailing, the type is dismantled and soon dumped into the melting pot for re-use. Occasionally, when we anticipate that several hun-

Uncle Sam Needs Chemicals for Victory!

Schaefer answers today's lacquer scarcity with . . . **BAKESEAL KILNVAR**

A varnish-type finish that gives lacquer speed

BAKESEAL is the new, tough, full-bodied undercoat that provides a proper foundation for enduring finish.

KILNVAR is the new varnish-type finish that gives rich, lasting depth on fine cabinet goods, resists hard knocks. Offered in Gloss Rubbing, Semi-Gloss or Flat effects.

Both these materials are designed for conditioned dry room production to satisfy the demands for speed—or for air drying. Ask the Schaefer representative in your district for the complete story!

THE SCHAEFER VARNISH CO., Inc.
Louisville, Kentucky

I. C. D. FORMULA NINE

« *wax free* REMOVER »

for paint, varnish, lacquer, baked enamel, cement, etc.

in defense production use

NON-INFLAMMABLE—EASY TO APPLY . . . NO AFTER-CLEANING

I-C-D FORMULA 9 is safe, non-inflammable and wax free . . . can be brushed or sprayed . . . Doesn't raise grain nor discolor . . . it costs less to use . . . saves time, labor and material . . . Prompt deliveries to manufacturers with **PRIORITY RATINGS.**

DEFENSE PROTECTIVE COATINGS—I-C-D Labs. have specialized in formulating and manufacturing non-inflammable protective coatings. If you have a tough defense protective coating problem send in your specifications and requirements for quick action. Write today.

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31 MADISON AVE. NEW YORK, N. Y.

Save Time and Money

BY USING QUICK, SAFE

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Enthone baked enamel strippers cut actual stripping time from HOURS TO MINUTES . . . quickly and safely removing baked enamels of the urea-formaldehyde, resyl, glyptal, glycerol-phthalic anhydride and bakelite types as well as many long-oil types of japans and air-dry enamels. Non-caustic, will not etch or attack any metal. Strip rapidly-rinse freely!

Write TODAY for FREE SAMPLE and valuable advice for cutting your enamel stripping costs.

The ENTHONE Co.

NEW HAVEN, CONN.

Chemical Products

Speed war-time production this new way!

"FRANCIS" ROLLER-COATING MACHINES

. . . for PAINT COATING METAL SHEETS (Model SPO)

. . . for APPLYING DRAW COMPOUND (Model SPB)

One prominent manufacturer now using a new Francis Roller Coating Machine, Model SPO, for painting metal sheets (in place of hand spraying) reports 75% savings in paint and labor, plus big savings in time through stepped-up production.

Model SPB Coater, for applying draw compound to steel sheets, also speeds output over hand brushing or other methods . . coats with a smooth, uniform spread. Users report up to 1-3 savings in draw compound. . . May we show how these machines fit into your specific production needs?

Top: Model SPO

Right: Model SPB

Get Complete Facts About . . .
FRANCIS COATING MACHINES

CHAS. E. FRANCIS CO.

RUSHVILLE, INDIANA

dred or thousand reprints of an article may be ordered, we have the type put aside for a while. Otherwise it must be set up again, proof-read, corrected and revised just the same as new manuscript.

When only one or a few copies of an article are requested promptly, we can usually obtain tear sheets from mutilated copies. We retain only a few new copies for office use. With the exception of these few copies, the entire issue is mailed promptly to readers.

Finish for Bakelite

I would like to know if there is a finish of the quick-drying type that can be applied over canvas-base Bakelite. This type of Bakelite has a glazed finish on both sides. I also desire the address of a few manufacturers handling this type of paint, if any.—R. G.

Gas for Enamel Ovens

I am desirous of securing information on a gas producer, using oil as fuel, for the supply of gas to our two enamel baking ovens. The size of each oven is approximately 12-ft. 6-in. by 14-ft.6-in. by 10-ft. high. Can you please furnish me with this information and also the method of installation?

I would like to state that I find your INDUSTRIAL FINISHING most interesting and helpful.—J. A. M., Works Manager, P. S. Furn. Co., Ltd., Johannesburg, S. Africa.

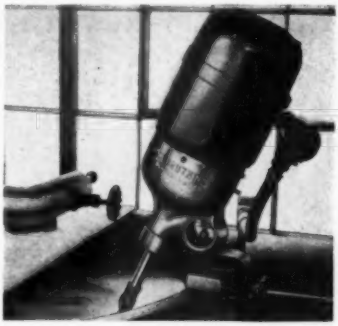
Varnish Removing

I would like to see some articles on varnish removers and their use, as this is one of the big problems of the refinishing shop. Can some of your readers tell of their troubles and how they overcame them?—F. Furn. Co.

Grained Finish on Cheap Solid Wood Furniture

It was only last week that I returned to Mexico, after going through some of the principal cities in the southern part of the U. S. trying to contact new agencies, when I ran across your INDUSTRIAL FINISHING magazine. Now, with it, I will not only obtain all sorts of information for this new line I expect to develop, but I will also economize on traveling expenses. I wish to subscribe to it and inclosed you will find draft for $2.00 covering one year's subscription.

In this connection I would like to



Direct Drive "LIGHTNIN" Portable Mixer used for maintaining proper consistency and suspension of pigment in a special enamel. Where colors vary frequently and quantities are not too large, this type of agitator can be conveniently changed from one tank to another.

KEEP PIGMENTS IN UNIFORM SUSPENSION AND REPLACE EVAPORATION LOSSES WITH A "LIGHTNIN" MIXER

With primer dipping tanks operating 24 hours a day, consistency must be constantly maintained in the quickest, most dependable manner . . the reason more "LIGHTNIN" Mixers are being specified than ever before.

The powerful "LIGHTNIN" Double Mixing Action drives pigments up off the tank floor and keeps suspension uniform. The complete bottom-to-top turnover plus a slow rotating which completely eliminates dead spots thoroughly mixes in thinner to make up for evaporation losses.

If you have a problem keeping pigments in suspension or keeping consistency uniform, consult us. Our specialized mixing experience is yours for the asking.

MIXING EQUIPMENT COMPANY, INC.

1027 GARSON AVE. ROCHESTER, N. Y.

KEEP 'EM ROLLING WITH SEA-LAC DEFENSE FINISHES

Well known SEA-LAC Primers and Enamels speed Defense Orders through Finishing Room Bottlenecks

Contractors and sub-contractors using army, navy or aircraft lacquer enamels and primers rely on SEA-LAC Finishes for economy and satisfaction.

Years of experience in government specification finishes are behind every SEA-LAC defense order. Each shipment is carefully tested for high SEA-LAC standards. Rush orders filled promptly.

SEA-LAC shell and bomb coatings have been leaders since 1933. Recent production tests show SEA-LAC to be ideal for modern high-speed automatic spray equipment.

Other SEA-LAC specification enamels and primers are helping to "keep 'em rolling" . . . finishing defense orders on time, every time.

Get DURALAC quotations and full information before estimating your next defense contract. Ask for SEA-LAC samples or extruded testing panels. SEA-LAC coatings are at least 92% as flexible as the metal on which they are applied.

Speed up production and enjoy smooth sailing with

SEA-LAC

Duralac Chemical Corp.

84 Lister Avenue Newark, N. J.

give you some points on what we mean by expecting to develop a new line.

We have been in the metal and wooden bed manufacturing business for some time, but now, as the metal bed is becoming rather difficult to make, we would like to cover other wooden furniture parts and, in doing so, would like to introduce new finishing. All of this information we have amply found in your INDUSTRIAL FINISHING, but being that we have not had close contact with all of the products listed, it becomes rather difficult for us to classify their practical value. In other words, the manufacturing of cheap wooden furniture, beautified by a grain process which we are now developing, should lead us to a profitable business if carefully and economically managed. It is in this particular sense that your information would be most greatly appreciated, unless otherwise you could contact us with the proper source for this information.

The wood used in this country is not dry like in the U. S., and veneered furniture is very much disliked. So, as you see, people have no choice from the ordinary typical furniture, and this makes us believe that a new finish, even on wood being as stated above, will have a considerable demand.

If it should come under your management to contact foreign agencies for your advertisers, we would be only too glad to offer our references and this, of course, would place us in a position whereby any information you may want in Mexico, we shall be very glad to forward to you.—W. O. Simpson, P. O. Box 1277, Apartado, Mexico, D. F.

Molded from Wood Flour

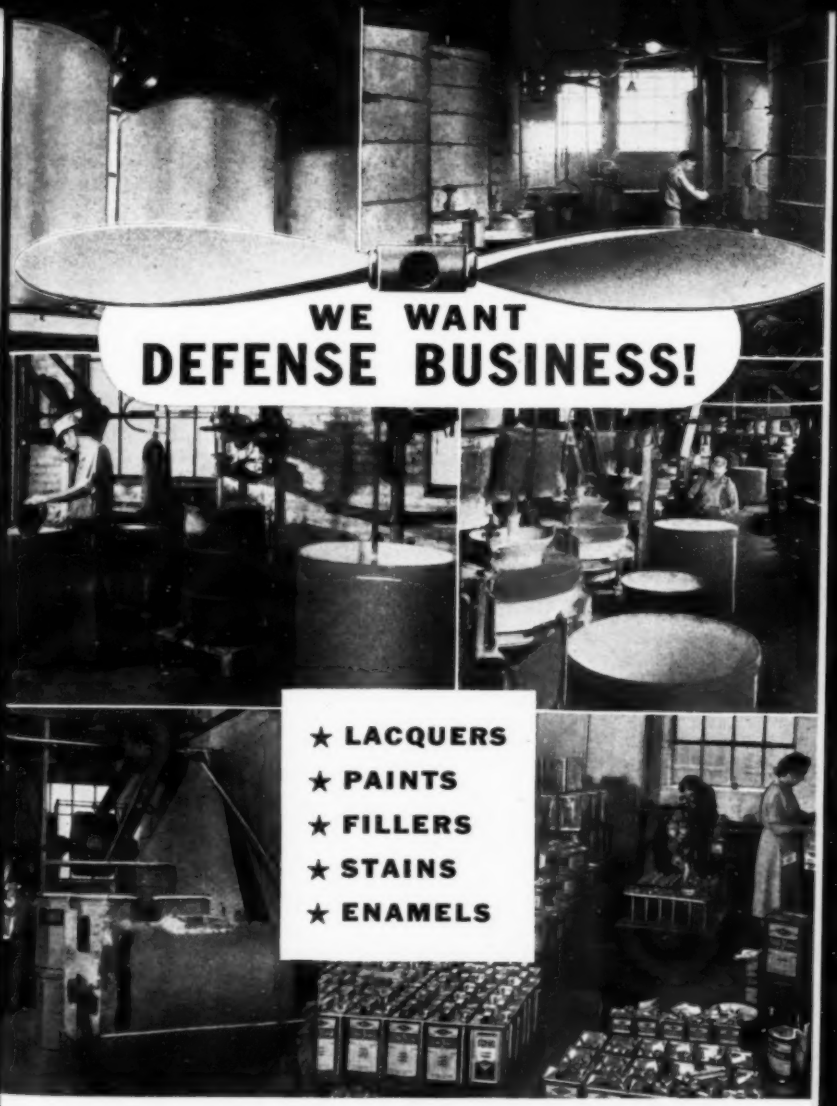
We are in the market for a large quantity of articles molded from wood flour. We thought that you might have the names and addresses of firms who do this molding and, if possible, we would like to have whatever information you can give us regarding same. In view of the fact that we must act promptly, we hope that you will find it possible to let us have this information by return mail.—C. I. Co. (Right-time Toys).

Acid-Resisting Finish; Heat-Resisting Finish

In your "Letters from Readers" section of December issue, there are two inquiries which are of particular interest to us.

We feel that we can supply your inquirers with an acid-resisting air-dry

(Continued on page 99)



STILLE-YOUNG

MANUFACTURERS • 2300 North Ashland Avenue • CHICAG

Finish Materials - 1942

BY S. P. WILSON, Ph.D.

IN THE January 1941 issue of INDUSTRIAL FINISHING there appeared an article by this writer entitled, "The War's Effect on Finishing Materials". The possible dislocations and maladjustments of supplies of various essential raw materials, due to wars then raging and those that might occur, were discussed.

Unfortunately, the prophecies then made have come true. With the entrance of the United States and Japan into the arena, a series of far-reaching effects have struck at the fundamentals of modern and successful paint, varnish and lacquer manufacture, and they bid fair to disturb, to very serious degree, the output of non-defense products. Let us briefly recapitulate the situation now existing after the declaration of war in December, 1941.

Raw Material Shortages and Reasons for Them

Before war was declared many serious difficulties had been encountered. The use of aluminum powder in finishing materials has been practically forgotten. China wood oil was coming in so slowly and at such cost that, despite manifest inferiorities, other substitute oils had to be used—usually in conjunction with hard resins of the synthetic phenolic or natural fossil types.

Titanium pigments became scarce due to shipping shortages and the vast demands made by the shipping program and other defense and defense-included business. The price of all imported resins and oils steadily rose as freight and insurance rates soared. Phenol and its derivatives, including many of the best synthteic varnish gums, were put on a strict priority basis.

The demands for dibutyl phthalate in smokeless powder and synthetic rubber together with the demand for phthalic-containing finishes for defense work, such as truck and tank finish, aircraft finish, ship paints, etc., made the securing of those resins difficult. The shortage of methanol, due to the conversion of methanol plants into ammonia plants, led to a great shortage of formaldehyde which, in turn, affected adversely the output of urea-formaldehyde, phenol-formaldehyde and melamine formaldehyde resins, as well as the derivatives of penta-erythritol, which had just begun to find a worthy place for themselves in the finishing industry.

Zinc was rationed and zinc pigments became scarce. Demands for chromium, necessary for alloy steel, led to a diminishing of the lead chromate pigments, such as yellows and greens. This was accentuated

by the huge demand for zinc chromate from the defense industries, which use army and navy primer specifications that contain this pigment in great quantities.

Alcohol, as had been predicted, became so much in demand for smokeless powder manufacture that severe shortages have ensued. Other solvents, such as ethyl and butyl acetates, became scarce due to shortages of alcohols involved and of acetic acid. From end to end of the finishing industry, the anticipated difficulties arose.

However, most companies managed to get materials to handle their customers' most pressing needs. By formulating with what was most available, by using stocks accumulated last year and by taking as much defense work as possible in order to be assured of a source of materials via priorities, the paint, varnish and lacquer industry has done a remarkable job of "business almost as usual" to date.

Imported Materials May Be Eliminated Because of War

With the declaration of war between this country and the axis powers, the problems for 1942 become immeasurably difficult. Where the transportation of gums and oils from Pacific points was tedious and expensive before, it is now and probably will be for some time to come, impossible. This means either total or partial curtailment of such items as shellac, dammars, Manila, elemi and batu gums (widely used in a myraid of finishing material formulas); also, China wood oil, cocoanut oil, perilla, etc. With the possibility of German forces moving down into Africa, the African copals, such as Congo, may be drastically affected.

To the finisher this means that varnishes and enamels of the better type, the almost universal shellac, the batu types of sealers, and a host of other reliable finishes may soon not be procurable at all. As far as the more recent formulations, using either alkyds or phenolic resins with softer oils such as linseed, soya and dehydrated castor, are concerned, the situation is no more promising.

Phenol is of prime military importance; so is the nitric acid from ammonia which is being made in the methanol plants, which once were the starting point for formaldehyde. Whether there will be any of this material available for civilian use is to be determined, but in any event there certainly will be much less, with the demand increased by virtue of the stoppage in imported natural products.

Glycerine has become scarce due to the needs of war and the necessity for conserving available supplies of oils from which it is made. This affects not only the alkyd resins but even the ester gum, which once was so plentiful and cheap that its presence in a formula was apologized for.

A Shooting War Demands Vast Quantities of Material

A shooting war means the multiplication of powder factories, using up alcohol and dibutyl phthalate in immense quantities. It calls for TNT. to practically the maximum of the toluol available, however great that may become. It demands synthetic rubber, absorbing huge quantities of many key chemicals. It takes chlorine which affects such diverse products as tricresyl phosphate, vinyl chloride and chlorinated rubber finishes. It devours zinc, lead, titanium, cadmium chromium and antimony derivatives to

a degree unknown before, thereby striking at the fundamentals of our pigments.

War means the multiplication of ordnance and aviation equipment, ships and shoes and sealing wax and everything needed for a huge army, navy and air force—in action. Therefore a shooting war means there will be less material of all kinds, particularly of the metal and chemical types, available for purely civilian use. This definitely includes finishing materials and the problem must be faced by manufacturers and users alike.

Defense Industries Will Be Supplied

Insofar as possible it is presumed that any manufacturer will endeavor to convert his product to defense items. For these, undoubtedly there will be adequate finish supplies. It is quite probable that, to some degree, an allocation of material to civilian industries will be made, but it would not be safe to count on too great a percentage of normal requirements there. After all, when there is only so much of a needed substance available under present conditions, it can't satisfy all of the demands made on it.

Use What You Can Get

In some degree, the problem of finishes is self-limiting. Those who cannot get the steel, brass or zinc that they once finished, will not need the protective coating materials. The curtailment of automobile, refrigerator, washer and vacuum cleaner businesses will relax appreciably the demands for lacquers and enamels, of which these manufacturers were once among the largest users.

For those who can get adequate metal supplies, but who are unable to get sufficient amounts of the type of finishing materials they need, there seems to be only one solution. *Use what you can get.* If black wrinkle is unobtainable, use a black japan. If you can't get bright clean greens, use the muddier colors if they can be obtained. If you can't get a hard finish in 10 minutes, adapt your ovens to take a bake of an hour, or more if necessary.

Your supplier is as much concerned about it as you are, but he can do little beyond offering the best material he has available at the time. It will be folly for a civilian material finishing room to set arbitrary quality standards. Now the ability of a foreman to take what he can get and make a decent job of it will be the test of his qualifications.

Your supplier is having plenty of worries, not only about his own business but about those of his customers. He would like, at any cost, to keep his old and valued customers supplied with as much of his best materials as they want, but he knows that present conditions may render that impossible. You may be sure that he is avidly studying any possible substitution that might have merit, and that if there is a solution for your problem he will be as happy as you to find it.

However, and most unfortunately, there will be many problems go by without a solution, and many more where the solution will be imperfect. After all, there is no way to make omelettes without breaking eggs. A war digs deeply into every nook and corner of our storehouses and takes what it needs first, leaving only the residue to civilian needs. This must be understood, and whatever adaptation to the fact, that can help in any way, should then be undertaken.

Plenty of Wood Available; Design for Less Hardware

The wood-finishing industries apparently will be in a peculiar position. There seems little chance of a shortage of some suitable wood for furniture and other wooden articles. The tendency of the government has been toward encouraging the replacement of metal by wood in many cases. Some shortages of special veneers, made from imported woods, are to be expected but there should be enough walnut, oak, maple, gum wood, etc., to carry on. What to expect in metal hinges, screws, drawer-pulls, etc., is less encouraging and may prove one barrier to a high output of wooden articles.

The finishing materials used by the wood industries offer a more serious problem and one that will require much thought and all-around cooperation to solve. Whether the finish is to be rubbing varnish over sealer or shellac, or flat varnish or lacquer, the problem of securing finishes of reasonable durability and appearance—and yet drying with some relationship to present schedules—seems to be exceedingly difficult when present supplies are exhausted.

Wood Finishes; Substitutes

Let us start with varnishes where tung oil with rosin ester, or tung oil with fossil resin, replaced the kauri and congo gums and linseed oil types of material many years ago. Assume that there is no available tung oil, no imported fossil resins and no maleic or phenolic resins to substitute, and it is easy to see that varnishes of the tough, hard and reasonably quick-drying types are going to be very scarce.

A strong attempt will be made to fill the gap with rosin derivatives and such oils as dehydrated castor oil and the fractionated drying oils extracted from fish and soya bean oils, as well as specially treated linseed, fish and soya bean oils that are now being developed. It is doubtful whether there will be adequate supplies for some time, even of these products. The finisher will surely have to adapt himself to a peculiar type of finishing material, and the furniture buyer will have to adopt a much less critical attitude toward furniture finishes.

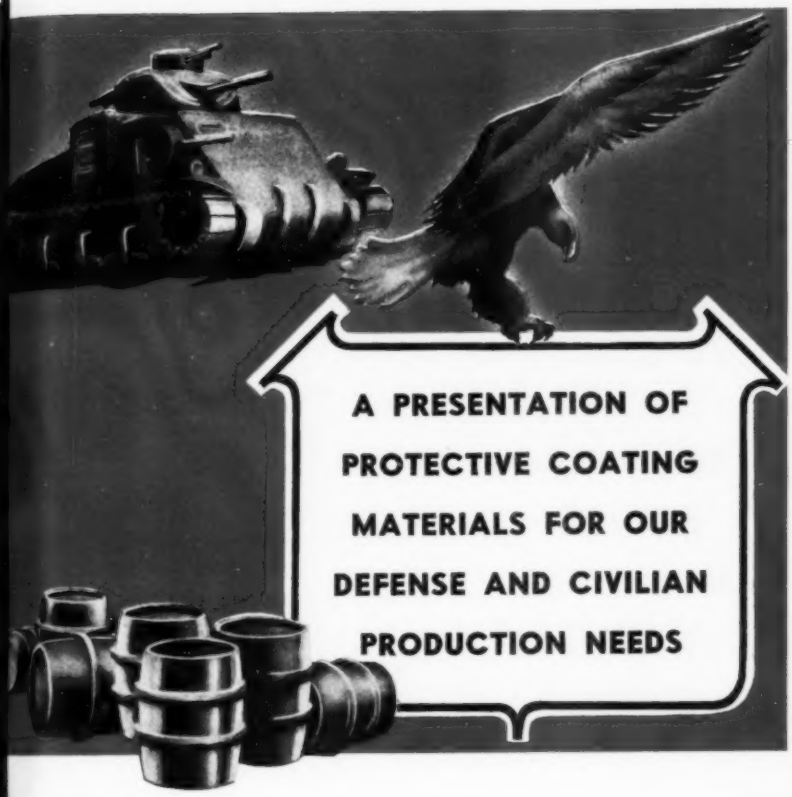
Shellac; Imported Gums; Nitrocellulose Lacquer

Where shellac was used, either as an all-over finish or as a sealer, the situation depends on how soon trade with India is resumed and how much alcohol can be released to our industry. The present outlook is not favorable, but this may change before present stocks are entirely exhausted. The same applies to finishes based on batu, Manilia, Pontianak or East India gums. All present stocks are frozen in warehouses and the time and proportion of release for non-defense work are at present unknown.

As for lacquer, we have much the same picture. Even if nitrocellulose and solvents are obtainable in some reasonable proportion to last year's output, the loss of natural resins (such as shellac and dammar, the alkyds and phenolics, the tricresyl phosphate and dibutyl phthalate plasticisers) makes it questionable whether there will be anyhere near enough lacquer available, after defense needs and the above mentioned shortages are considered, to keep the non-defense industries going if they attempt to equal the output of 1941.

No one can predict quantitatively what to expect. Many factors involving available stocks, substi-

(Continued on page 84)



INTENSIFIED National Defense production and our active participation in World War II have accelerated both the development and the demand for protective coatings. Really, protective coatings are now elevated to their highest pinnacle of importance and value. The fact that they serve to protect and prolong the useful life of so many essential products made of metal, wood and composition materials—and even fabrics, rubber, leather and paper—has long been known but not sufficiently appreciated. Now, however, it is becoming more widely realized that paint, varnish and lacquer coatings are useful for something more than just to "pretty up" a surface or a product.

Actually, there is scarcely a piece of equipment among the thousands being made for the armed forces that does not require a coating of some kind. Even bombs are carefully finished inside and out and automatically sprayed so that not a single bare spot can remain to react with the explosive. Shells must also be coated inside and out—inside to prevent dangerous reaction between metal and explosive, and outside to prevent corrosion; also for identification. Today automatic machines coat and bake shells of all sizes at remarkably high rates of speed.

All of the army's mobile equipment, such as tanks, combat cars, scout cars, troop carriers and supply tanks, have to be painted with flat olive drab for protection from the elements, prevention of corrosion, and to give low visibility to blend with the surroundings.

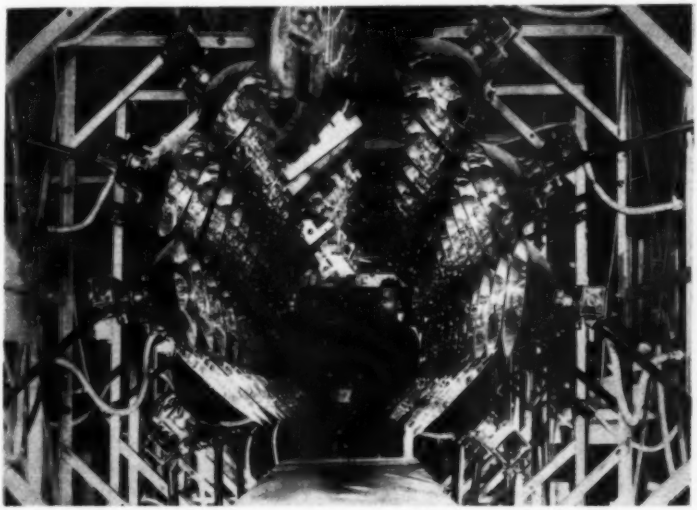
All airplanes require special finishes including primers and enamels of extreme durability and toughness, yet remarkable thinness of coating.

The ships of our navy are kept constantly painted for protection and are now camouflaged against easy visibility.

Then there is the vast amount of auxiliary equipment—trucks, gun carriages, helmets, tractors, etc., requiring paint coatings.

With plants already loaded to capacity and working "around the clock", we now add to the needs of our defense production vast quantities of black-out and camouflage paints. A tremendous demand has sprung up since December 7th, and several factories are now turning out large quantities of a flat black paint for blacking out industrial plants, where windows must be coated on the outside in order to prevent glare and light reflection. Camouflaging of defense plants has brought about a new demand for neutral "concealment" colors which blend in with the landscape. These are now being produced in increasing quantities.

Many raw materials for paint manufacturers are on the critical list, including several of the basic metals which are so important in paint manufacture—such as lead, zinc, titanium, aluminum, etc. Many of the liquids used in paint manufacture



Pratt & Whitney Division of Niles-Bement-Pond Co., in West Hartford, Conn., manufactures many different sizes and types of gages. Since the installation was completed, several foremen of different departments in the plant have brought in new parts to be finished—parts that formerly were not painted. The ease with which the combination of infra-red baking and conveyor system handles the work has opened up new finishing applications in all departments. This installation was prompted by a large government order for small gages.

The baking time cycle is 12 minutes. Photograph, courtesy of Pratt & Whitney.

are equally in demand in the making of ammunition, and in other defense industries. Several of the natural gums and oils can no longer be obtained because of the war, although it is more than probable that certain companies have considerable stocks of these on hand.

Numerous substitutes have had to be found or developed to replace materials which are either no longer available or which can no longer be obtained in sufficient volume for all types of finishing. Tremendous quantities of both raw and finished materials have been and will continue to be diverted to defense and war uses.

Extensive research work is being conducted on all types of raw materials and methods of manufacture, and real progress is being made, but in some instances this progress has not

Protective coating materials included in this Major Review are grouped under the following five general headings:

Defense Protective and Concealment Paints	pages 23-37
Protective Bake Finishes for Metal	pages 38-41
Air-Dry Coatings for Metal	pages 41-42
Protective Coatings for Furniture	pages 42-45
Other Coatings, Protective and Decorative	pages 45-46

Please notice the item number following each listed material. When or if you request the name and address of the manufacturer of the material, kindly refer to this code number.—Editor.

reached the point where the manufacturers want to make specific comments on the results.

The question uppermost in the minds of the users of finishing materials today is: "Will the proper substitutes be found to replace certain essential finishing materials that will perhaps soon be unobtainable?"

This question concerns not only the manufacturers of civilian products but also the welfare of tens of thousands of workers employed in those industries. As we are gradually going all out for war and defense activities, the demand for these essential protective coating materials for use in defense production will grow greater day by day. The quantity of certain materials available for non-defense industries is rapidly diminishing, and before long many of them will be unobtainable in non-defense industries. .

It is a serious matter but we feel certain that the manufacturers of protective coatings will solve this great and vital problem. They have solved many other "impossible" problems in the past. As a matter of fact, several substitute finishing materials have already appeared on the market and while improvement is needed and will be forthcoming in some of them, we have the word of certain users that most of these substitute materials are as good, and some are perhaps even better than the materials they are replacing.

Many civilian products formerly made entirely or partly of metal are now being made of wood, and more will follow.

Naturally this calls for more wood finishing materials of all kinds. Among these there will be an increasing demand for certain impregnating liquids that serve to make the wood moisture resistant so it will be less liable to warp, swell or shrink when subjected to atmospheric changes and differences in climate. Over these properly treated wood surfaces it is promised that thin films of protective coatings will eventually be the order of the day—except in rare cases where heavier coatings may be necessary. A few of the wood articles on which surface appearance is of less importance (handles, for example) will probably be coated with oil or wax after having been treated with some thin impregnating sealer.

DEFENSE PROTECTIVE & CONCEALMENT PAINTS

THE materials in this group are particularly applicable for use on the surfaces of products and areas having to do directly or indirectly with National Defense. Many of them, of course, are useful for other purposes also. These materials include metal primers and top coats in both baking and air-dry types, rust-inhibitive coatings, heat-resisting paints, coatings for the insides and outsides of shells, olive-drab paint, camouflage paints, aircraft dopes, blackout paint, coatings for rubber, machine-tool finishes, army-cot enamel, and plywood sealer.

Zinc Chromate Primer—One of the best specifications established by both the Army and the Navy is their regular zinc chromate primer. This primer is a rust-inhibitive type, dries with the speed of lacquer, has good mileage, and is resistant to the application of subsequent coats of synthetic enamel or lacquer. One of the difficulties encountered was the rapid and hard settling of the zinc chromate pigment. S-W Primer, meeting both Army and Navy specifications, has eliminated this difficulty. The pigment remains suspended for a long period and will be ready for use when easily stirred after remaining in storage for a considerable length of time 109

Zinc Chromate Primer—Designed as a corrosion-inhibiting primer for use on aluminum, aluminum alloy or steel, under oil enamels such as E-5 and E-6, and lacquers such as L-12 and L-8, and for touch-up purposes over old work of these finishes. A medium coat should be applied so that a distinctly greenish cast is produced. When application is such as to yield a full yellow coat, it is indicative of too heavy coating and should be avoided.

This primer when applied with normal film thickness will dry to be safely handled in less than five minutes. For emergency work succeeding coats

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Acknowledgment by the Editor: Some of the material used in the introductory paragraphs for this section was supplied by R. J. Fairburn, H. W. Chester, Harry Daniels, Russell Davis and E. C. Shurtleff, plus excerpts from an article by Arthur W. Steudel, President of the Sherwin-Williams Company.

So far as defense finishes go, most of them are conventional types of lacquer and synthetics, applied in a conventional manner. Tests of these materials are conducted at such places as Wright Field, Dayton, Ohio, for areonautical finishes; Fort Monmouth, N. J., for signal corps finishes; Rock Island arsenal for ordnance finishes, etc.

The signal corps uses an ordinary black wrinkle on some parts, an olive-drab alkyd-resin enamel on others and a dull black urea-resin enamel on still others. Airplane motors have a coat of zinc chromate primer, followed by black or gray glycerol phthalate enamel, baked to maximum toughness and for resistance to heat and gasoline.—R. J. F.

may be applied after one hour drying of the primer. It is recommended, however, that a drying period of 6 to 24 hours be allowed when possible.

The time of baking may be reduced in proportion to the temperature increase. Since most aircraft metals should not be baked at temperatures over 160°F., the primer may be baked 1½ hours at this temperature. Baking will produce more satisfactory metal anchorage to cadmium plate and similar surfaces.

When it is necessary to apply insignia and marking lacquers over areas previously coated with oil enamels, this product may be satisfactorily used as a sealer. Apply the primer in the same manner as for dope-proofing, and subsequently apply the lacquers as dry as practicable. A drying time of at least 6 hours is recommended for the primer when it is used as a sealer.....155

Synthetic Rust-Inhibiting Primer (Lead Chromate Type)—QMC Specification E. S. 359-B. This specification covers one grade of rust-inhibiting primer for general use as the first coat on steel. This primer is intended for use under synthetic olive drab lusterless enamel. The primer will spray satisfactorily when thinned 15% by volume of thinner, U. S. QMC Spec. ES-370B. If a pressure tank is used approximately 4 to 6-lbs. pressure on the liquid should be sufficient with 55-lbs. per sq.in. air pressure at the gun. A thin wet coat should be applied by working with the gun comparatively close to the surface. If applied too dry, caused by too much air, improper atomization, insufficient reduction or holding the gun too far from the surface, satisfactory results will not be obtained.

A fairly light coat of material should be applied so that the dried film thickness is between .6 to 1.1 mils. This is normally indicated by complete hiding of the natural color of the metal beneath the primer without excessive build in the material. A pronounced yellow-green color should result. A sprayed film of the primer will become dust-free in not more than one hour and will dry hard to handle in 16 hours of air drying at a minimum temperature of 55°F. and maximum relative humidity of 60%.

Since this primer is usually applied on large products, such as automobiles, trucks, tanks, etc., air drying will be the most widely used form of drying. However, the material may be force dried where practical to do so, using temperatures up to 250°F. At this temperature a one-hour bake will result in a film comparable to that obtained by air-drying 15 hours 153

The art of camouflage has changed greatly since 1917. Camouflage is purely a matter of light dispersion. Take a picture of a sleek, jet black cat and he has dazzling highlights on him. Ruffle his fur the wrong way and retake in the same light and you have a pair of eyes —that's all.—W. T. Smith.

Zinc Chromate Primer, 67-108—Made in strict accordance with U. S. Army Air Corps Specification No. 14080; has exceptional can stability, uniformity of contents from one batch to another, resulting in standard reduction. Because of the formulation, this material possesses extensive covering qualities, resulting in a low per unit cost 120

Primers and Enamels—Made to conform to QMC Specification 359-B, 474-C, 510-B, etc., together with the revised QMC Specification 680; have been especially designed to meet the requirements of the automotive industry. Of prime importance in these finishes, in addition to meeting of application specifications, is speed of drying, ease of application, perfect can stability, maximum reduction, low resultant cost. One of the outstanding qualities of these products is the fact that shipments are absolutely uniform and can be made on short notice....126

Gloss and Synthetic Enamels—Made to conform to Air Corps Specification 3-98-D and 14109, for camouflage, combine speed of drying with extreme durability. The gloss enamels have a maximum gloss retention upon exposure, while the camouflage enamels have high resistance to the taking on of luster resulting from friction or abrasion 124

Lusterless Olive Drab Synthetic Enamel—Is normally called for on articles purchased by the Quartermaster Corps, such as artillery components, combat vehicles, motor transport vehicles, tanks, pontoons, etc., and is designed to reduce the visibility of army vehicles and equipment by eliminating almost all reflection from the finished surfaces. The olive drab color is designed to blend in with foliage and surrounding terrain.

It is generally applied over rust-inhibiting primer QMC Specification ES-359-B. A medium coat should be applied, normally resulting in approximately 1.5 to 2.5 mils. thickness in the dried film. This will provide complete hiding of the light yellow-green color of the primer beneath. A normal film of "Enamel 202263" air dries to the touch in 30 minutes, and may be handled safely in between 2 and 4 hours, which is much faster than the 20 hours allowed under the specification 156

The defense program has presented manufacturers with all kinds of finishing problems they never faced before. Spray equipment manufacturers are designing and installing a large number of special machines and assemblies which will keep quality finishing abreast of new production speeds. Some of their shell-finishing installations are particularly interesting and efficient.

Army Cot Enamel (Light Grey Synthetic) — Made to conform to QMC Specification No. 5, which is sometimes known as exception to 32-2A and 32-7A. This enamel is primarily for dipping and has the unusual characteristic of absolutely no floatation of colored pigment both in the initial mixture and when the tank has been adjusted for viscosity after several days dip application. It has also extreme tolerance for various grades of naphtha and reducers, which makes it readily adaptable to many plants having various finishing conditions..125

Lusterless Coronado Tan Synthetic Enamel — QMC tentative Spec. E. S. 680. This enamel is used on motorized equipment, such as combat vehicles, motor transport trucks, tanks, pontoons, etc., for export, and is designed to reduce the visibility of these army vehicles and equipment by eliminating almost all reflection from the finished surface. The Coronado Tan color is designed to blend in with the desert terrain. It may be applied over a rust-inhibitive primer.

Use thinner in accordance with QMC

Spec. ES-370B in accordance with the instructions. The material will spray satisfactorily when thinned with 15% by volume of thinner. Where a pressure tank system is used, approximately 4 to 6-lbs. of pressure per sq.in. is required on the liquid, and approximately 55-lbs. per sq.in. air pressure is recommended at the gun. A uniform flat coat of material should be applied, which, owing to its lusterless properties, dries rapidly in the initial stages. A medium coat should be applied, normally resulting in approximately 1.5 to 2.5 mils thickness in the dried film. This will provide complete hiding of the primer. A normal film of the coating air dries to touch in 30 minutes, and may be handled safely in 2 to 4 hours.....186

Heat-Resistant Black Enamel—Made to conform to U. S. Army Specification 3-135; has made it possible to arrive at trouble-free, mass aircraft engine production. Of prime importance is perfect drying, high-gloss retention upon baking, and non-crimping of enamel on the edges of the fin. This is of extreme importance to manufacturers who give the inside of the cylinders a kerosene cleaning, after finishing prior to assembly. Designed to take a 25% reduction, this material permits an extremely low cost per motor for finishing.....127

This workman is spraying one of the wings of a Ryan trainer airplane. He is working in a tunnel-type, conveyorized, down-draft water-wash spray booth. Picture supplied through courtesy of the Binks Mfg. Co.

Pyropex (Airplane Dope) — In the past, one of the commonest dangers of fabric airplanes has been the rapid burning rate of the nitrate dopes used for finishing. This difficulty could be overcome only by the application of cellulose acetate dopes which were comparatively non-inflammable but which presented problems of application and maintenance. In an effort to overcome these difficulties, this company's chemists developed an altogether new kind of airplane dope which they identified as "Pyropex." This new development retains all of the good characteristics of both the nitrate and acetate dopes, with the disadvantage of neither.....108

Clear Dope for Aluminum—Conforms to U. S. Army Air Corps Specification 14096; is extremely low in acid value, therefore permits the addition of aluminum paste or powder without discoloration 123

Airplane Dope—A "Low Inflammable" wing dope which does not burn rapidly, a fire once started only proceeding at the rate of one-half that of an ordinary wing dope. This material is advocated as a safety measure for fabric coated army and navy training 'planes.....173

Gloss and Camouflage Lacquers—Conform to Air Corps Specification 3-158 and 14105; are so designed that they dry almost instantly for immediate handling and yet stay relatively soft. This permits assembling of steel parts without flaking or chipping. This

MAHON *On-the-Roof* OVENS

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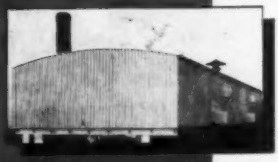

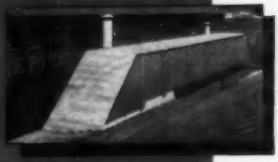

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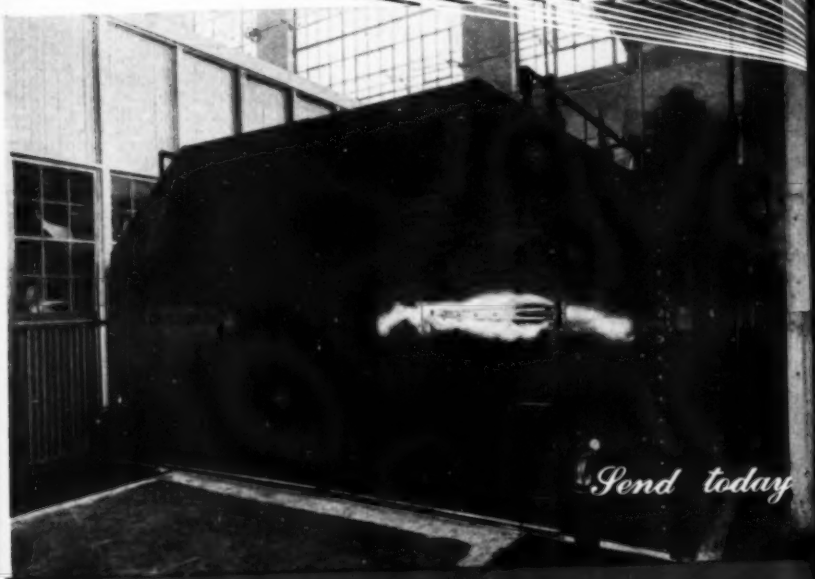

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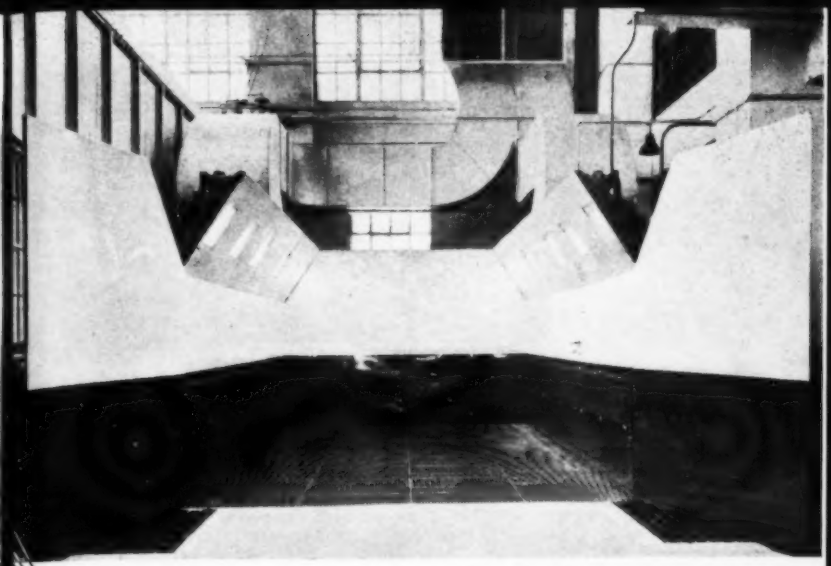

A LARGE Binks Dynaprecipator water wash spray booth has recently been installed in a government arsenal for use in refinishing tractors, tanks, and other mobile units. This type of booth is designed on an entirely new principle. It has no nozzles to clog and is much more efficient than the standard nozzle type washer. This same principle is available in a wide variety of industrial spray booths. Its value has been thoroughly demonstrated. Write for complete information.

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Defense Striping—One of our correspondents, visiting in Detroit during mid-December, reported a few observations as follows:

A manufacturer of striping tools is busy building automatic machines for making one, two and three stripes on moldings for automobile bodies; also, the same variations of stripes on automobile hub caps and wheels. The company is working feverishly to make deliveries before the first of the year. After that, when they expect no further work on automobiles, they are preparing to build automatic striping machines to make one, two and three various width stripes on aluminum tubing for use on airplanes. This tubing will vary in size from 1/4-in. up. The purpose of this striping is to serve as certain identification marks for the army, and various colors will be used. Some of the stripes will be wide, others will be narrow, and in some cases there will be a combination of both.

is of prime importance to sub-contractors as well as prime contractors, eliminating the need of touch-up work 121

Airplane Dopes—Conforming to U. S. Army Air Corps Specification 3-159-A and Camouflage 1 4 10 6; combine maximum speed of drying for mass production, with high initial tautness upon exposure....122

Shell Lacquers—Formulated in conformity with Ordnance Specification 3-162-A. Delivered at a consistency to permit 100% reduction with lacquer reducer. At this reduction, they provide maximum hiding power, speed of operation and ease of application in either manually or automatically-operated spray equipment. This particular line of shell lacquers has been formulated so as to produce maximum coverage per reduced gallon....119

Ammunition Lacquers—Lacquers covered by this specification are intended for use as an exterior coating for shells, bombs, grenades and other ammunition components. These lacquers are furnished in various colors as a means of identifying the various shells, bombs, grenades, etc. A distinctive color is applied in the case of high explosive shells, whereas a different color is used for shrapnel, gas shells, etc. These lacquers spray satisfactorily when thinned 50/50 with thinner.

An air pressure at the gun of between 50 to 60-lbs. per square inch will be sufficient, and in the event that a liquid pressure tank is used, between 2 to 6-lbs. per sq.in. air pressure on the liquid will be satisfactory. Sufficient material should be applied to give a uniform wet film over the entire surface which is free from sags or runs. A single coat of lacquer, applied in accordance with the directions, will result in a dried film thickness of between .8 and 1.0 mil.

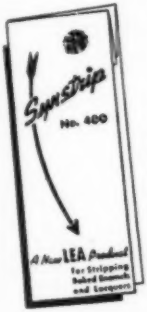
The drying time of these ammunition lacquers to touch is 8 minutes maximum. The dried film will withstand baking, hot water and, with the exception of blue enamel, cold water 154

Black Acid-proof Paint for Ammunition—This material is designed for a one-coat application to the interior of shells or bombs and is intended to prevent contact between the explosives and the shell. Were such contact to occur, it might result in a premature detonation of the explosive charge.

Type I, No. 202364, is suitable for application by spraying or brushing. It dries to touch in 15 minutes and dries hard in 45 minutes.

Type II, No. 202365, is suitable for application by brushing; dries to touch in 2 hours and dries hard in 8 hours.

We are in a position to supply this excellent stripping solution, even in large quantities. At the present time there is no priority affecting the raw materials.



LEA Synstrip is a liquid synthetic enamel stripper made especially for baked enamels such as the Glyptal and Urea Formaldehyde types, also many air dried finishes. It is fast and clean-working, leaving the metal surface in its original condition. The article can be rinsed with water, dried, and immediately re-finished.

LEA Synstrip does not corrode, etch or stain Aluminum, Brass or any other metals. It can be used at room temperature, but operation at 160° F. and higher is preferable.

Shipped in 1 or 5-gallon cans; 50-gallon drums.

I-LM-

THE LEA MANUFACTURING COMPANY

WATERBURY, CONN.

Specialists in the Production of Clean-Working Buffing and Polishing Compounds

In general, the dried film of these materials will not soften or flow when heated to 212°F. for one hour; it will withstand the action of cold water for 18 hours and will withstand the action of picric, sulphuric, nitratic and hydrochloric acid for not less than six hours 157

Anti-Acid Black (Specification 3-106-D, Type I—This specification covers an anti-acid black used chiefly for the interior of explosive shells. It has further additional uses on Government contracts and, with very slight adjustment, has been successfully baked 8 minutes under infra-red lamps, resulting in a tough, hard finish resistant to hard usage and outside exposure 110

Acid-Proof Black Paint, 30-806—Conforms to Ordnance Specification 3-106-D; gives to the manufacturer of shells two outstanding advantages over material frequently built to meet this specification. First, exceedingly rapid dry, being hard and dry clear through in from three to five minutes. This permits the immediate placement of the shell being coated on the exterior coating spindle for the exterior lacquer coat. In this way, handling and floor space for drying, and in some instances, heat, is conserved. The density of the color of this product and its high covering qualities results in the coating of an extremely large number of shells per gallon of material used..... 118

Warm Drab-Gray Gas-Mask Eye-Piece Lacquer—This material is designed for one-coat application on oxidized brass eye-piece rims on the new official U. S. Army and Civilian type gas masks. The eye-piece rim at the time of finishing is in accordance with Chemical Warfare Service drawing A5-2-275, and the lacquer must be sufficiently flexible to permit a forming operation which bends the tabs on the outer rim securely around the moulded rubber rim of the gas mask without fracture of the finish itself.

This is a high quality lacquer of excellent flexibility which will retain its plasticity indefinitely. When applied with normal film thickness the lacquer will air dry to handle within 7 minutes after spraying on oxidized brass parts 152

Sanco Clear Brushing Lacquer and Sanco Lacquer Thinner — Have been perfected to meet United States Navy Specifications in all respects. The lacquer is quite neutral, insuring no discoloration when used on brass or copper. It has excellent adhesion and great outside durability. The high solid content and low viscosity gives a full one-coat finish..... 183

Sanco Blackout Paint — Has been perfected for us in blacking out industrial plants. It is a dead flat black which can be brushed, or sprayed on the exterior of all glass surfaces. It is very durable and at the same time easily removable with solvent or scraper. Light does not penetrate through this paint..... 184

SP 3000 "Eclipse" Blackout Paint—Comes ready to use, and is applied quickly and easily by either brush or spray; has been more than a year in development in the manufacturer's laboratories, to make it the dead flat black that totally blocks the passage of light through defense plant windows; possesses remarkable weather-resisting qualities, together with the feature of over-night drying..... 167

Coatings for Rubber — Life rafts, floatation gear, life buoys, balloons and in fact anything requiring rubber or fabric in its construction must necessarily be given a protective coating —and it is in this field, where our years of experience and close contact with the major manufacturers of these products has given us much valuable information, that we expect to do our part in the defense program.

We have had a remarkable opportunity to work in close contact with

Remember Pearl Essence for Substitute Metallic Finishes

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Photo by Tokhe
Oil Tank and Pi
Company

EGGS' IS DEFENSE WORK"

● Painting eggs doesn't sound like a defense job. But "eggs" is army lingo for the high-explosive ten pound bombs that are hurled from 3-inch trench mortars. Tokheim Oil Tank and Pump Company of Ft. Wayne, Indiana, is turning them out at the rate of many thousands a day, on British and U. S. Army orders.

Painting these "eggs" is an intricate and exacting task. And Tokheim, which for many years has used DeVilbiss Spray Equipment to give its oil and gasoline pumps their attractive enamel finish, again relies on DeVilbiss for the answer.

It has installed three specially designed DeVilbiss Automatic Systems, one of which paints each bomb casing inside and out, while a second coats primer cup assemblies, and the third sprays tail fin units—keeping up with top speed continuous three-shifts-a-day production.

Tokheim's story is typical of the way DeVilbiss Equipment is helping industry solve new finishing problems in the transition from peacetime output to defense manufacturing. Helping to make America the arsenal of democracy. If your company is taking any part in that tremendous job, DeVilbiss Spray Systems can aid you to do it faster and better.

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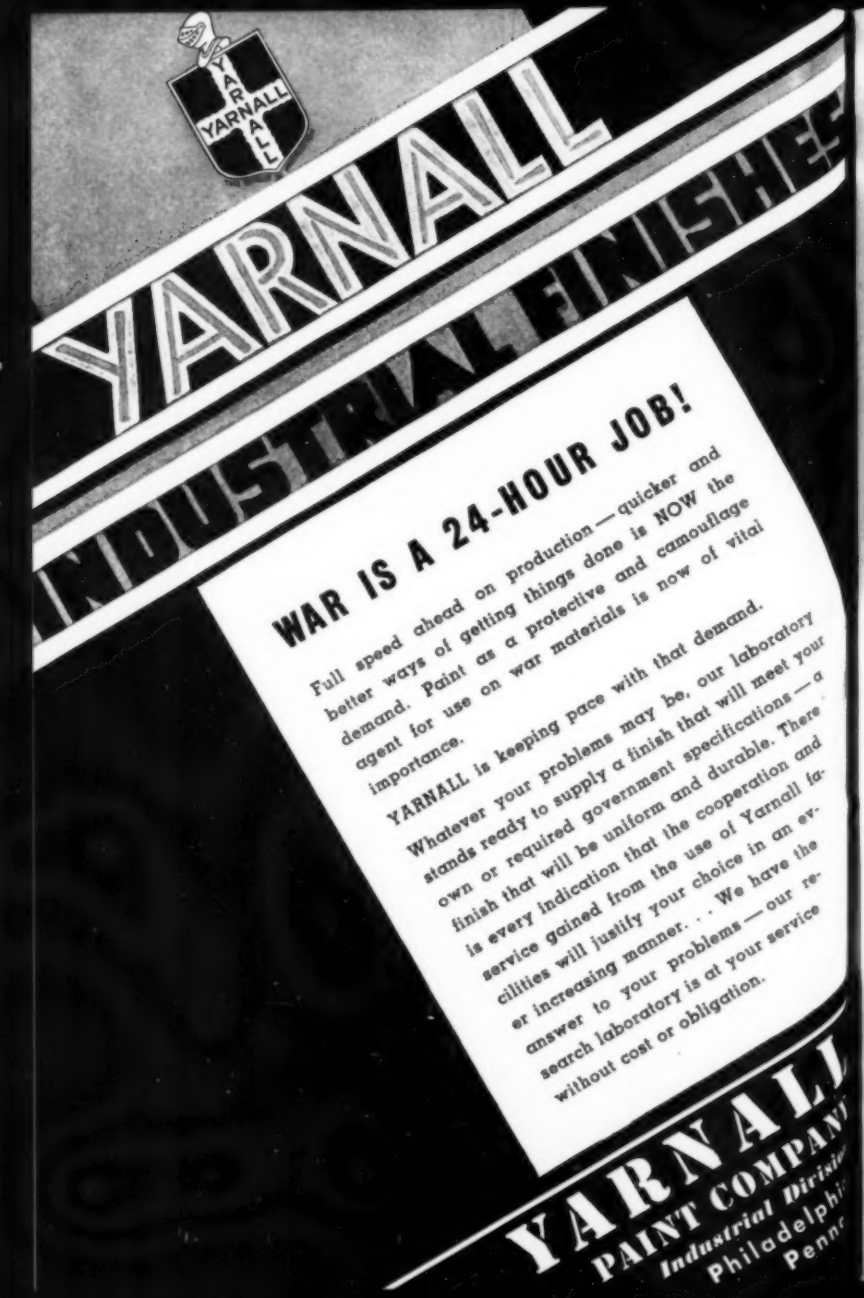
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WAR IS A 24-HOUR JOB!
Full speed ahead on production—quicker and better ways of getting things done is NOW the demand. Paint as a protective and camouflage agent for use on war materials is now of vital importance.
YARNALL is keeping pace with that demand. Whatever your problems may be, our laboratory stands ready to supply a finish that will meet your own or required government specifications—a finish that will be uniform and durable. There is every indication that the cooperation and service gained from the use of Yarnall facilities will justify your choice in an ever increasing manner. . . We have the answer to your problems—our research laboratory is at your service without cost or obligation.
YARNALL
PAINT COMPANY
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Philadelphia
Penna

the chemists of all the major rubber companies to develop protective coatings for all types of rubberized fabric . . . .

We feel that the war will be fought largely in the air and on the water, hence our desire to make the things used in this type of warfare the most durable and best possible to obtain..111

Machine Tool Finish—Complete "V" Series of finishes for castings and machine tools, especially adapted to defense requirements. Write in for descriptive wall hanger.....172

Protective Penetrating Wood Sealer—We have developed a heavy duty, penetrating seal for wood to prevent checking and to resist even live steam and boiling water, as well as alcohol, alkali and acids. One of the ordnance shell-loading plants, after their own tests, have adopted this for treatment of two carloads of plywood to prevent checking and to permit cleaning with live steam and boiling water. They selected our product, Arm-R, after making their own tests.

They have likewise used it to extraordinarily good effect on cafe and club table tops on which every type of liquid is spilled. In this instance, a beautiful finish is developed with two coats of Arm-R and one coat of our Varnowax which will resist anything spilled on it or boiling water or hot pots. Some of the leading clubs in this section are using it extensively for that purpose.

To finish birch or maple plywood, a problem arises in distortion and warping. This we have been able to remedy completely for an industrial customer who supplied the army with a large quantity of plywood panels made from these materials and reduced the loss from warping from 25% rejects to less than 1%. This was done with a dip coat of Arm-R, and it entirely supplanted varnish and surface coatings which were promised to control the warping of the plywood.

Under present conditions of difficulty in obtaining lacquers, it would seem to be of special importance to you that we have developed a fast-drying, waterproof, acid, alkali, alcohol and oil-proof spray which can be used on wood or even paper. It is best to apply by spray.

Normally, we would not mention this until its possibilities had been developed much more fully, but in these times and because raw materials are not effected at the present time by priorities, it might well be the solution of many problems in the industrial field and we invite inquiry, accompanied by explanation of the problem involved so that we can be of the greatest help in our recommendations for testing.....135

Kem Machine Tool Finish—Anyone who reads the paper knows that the machine tool industry has been working 24 hours a day turning out the machines that make the machines of war. And any development that speeds the output of machine tools is a real contribution to our Defense Program.

Such a development is the new Kem synthetic finishing system recently announced . . . . Many hours and even days can be cut from the finishing time formerly required on large tools, and far greater resistance to cutting compounds is obtained.

For tool manufacturers who cannot do a complete spraying job because of the machine design, and for manufacturers either not set up for lacquer or who need a more resistant finish, this new synthetic system is ideal. In many plants it has replaced oil finishes as well as lacquer . . . .

Compared with the oil enamel method, which required anywhere from 1½ to four days for finishing, the new Kem machine tool finishes can be applied in 6¼ to 9 hours—four or five coats. Here's the schedule:

Material Applied	Drying Time
Zinc Chromate Primer (spray or brush)	15-30 min.
Machine Filler	4- 5 hrs.
Kem Sealer Gray	15-30 min.
Kem Machine Tool Gray	15-30 min.

Allow an extra hour or more for further drying and crating, and you have a total of 6¼ to 9 hours.....107

BAKE COATINGS FOR METAL

PROTECTIVE coatings listed in this classification include those that require oven heat or exposure to banks of infra-red electric lamps to cure and harden them so that they form a protective film which is extremely hard, tough and durable. Bake finishes of good quality usually have excellent color retention.

Baked Synthetic Finish, S-52—Available in black and a wide range of colors. The range of colors here will be limited only by shortages in various colored pigments. S-52 produces a finish with high gloss, and excellent toughness and hardness. It may be baked on such typical schedules as one hour at 275°F., 1½-hours at 250°F., or ½-hour at 300°F. For some types of work the bake may run as high as 350°F. for shorter periods of time, although when using these baking schedules, S-52 will have somewhat less gloss, and there will be some color drift 112

"A" Lustral Enamel—A spar-type enamel of superior quality for both exterior and interior use. "A" Lustral simplifies industrial finishing problems because it is so well suited to a wide variety of uses. It means smaller paint inventories because this one finish takes care of maintenance of buildings and equipment outdoors and indoors, and product finishing as well. It can be applied by brush, spray, or dip and will either air-dry or bake..105

There is a general line of "Sanco" finishes for all war industries, for use in protective finishing and identifying shells, bombs, grenades, motorized equipment, containers, etc. All of these materials are made strictly in accordance with United States Army and Navy Specifications 185

Vedoc White Coating—Developed for use on the reflecting surfaces of fluorescent light fixtures. Its exceptionally high reflectance and high degree of permanency of reflectance makes it especially well suited for the purpose. Many of the defense plants are utilizing this type of lighting. The finish is a one-coat single-bake coating which withstands all ordinary assembly and installation damage. Baking schedules are sufficiently flexible to permit it to be baked in any type of baking equipment.....136

Light Gray Baking Finish—In many instances this material fills the need for a substitute for aluminum coating. It is non-metallic but provides an extremely durable finish of pleasing appearance. A wide variety of baking schedules may be used.....137

Alkali-Resistant White — A white coating having improved resistance to soaps and alkalies has been developed for use as a finish on washing machine parts and other products requiring out-of-the ordinary resistance to soap and alkali hazards. It may be used as a one or two-coat finish and may be baked at a variety of schedules 138

Low-Gloss Bake Finish — Produced to meet the need of a baking finish that will make metal imperfections less noticeable. This finish permits the use of poorer grades of metal surfaces for many non-defense purposes 139

Gray Primer X-3484—This material is unique in that it is being used as a primer, intermediate coat and finishing coat with equally satisfactory results. One use to which it is being put is as a flash-dry primer under a baking finish. A spray coat is applied and after drying 15 minutes in the air a baking enamel is applied and the whole is baked together.

When used as a primer, X-3484 takes lacquer, synthetic or oil-base materials without lifting. It was

I think there are probably two developments of ours which would be appropriate to mention at this time. The first is protective linings for steel drums and kits. The drum and kit industry is, of course, growing more and more important for defense uses, since these containers are used to pack a great many items such as oils, chemicals and other products vital to defense. These drum linings make the container practical to use and they became very popular during 1941.

Another development which I think might be worth mentioning is the finishes for infra-red. Since infra-red makes possible faster production, it is obviously an important defense contribution.—A. & W.

formulated so that it will air dry, force dry or bake. Incidentally, it may be baked at high temperatures with satisfactory results. It shows good rust-proofing properties and gives excellent resistance to moisture, salt spray, grease and alkali.....140

Ra-Bake Enamels—A complete line of enamels, in all colors, designed especially for baking in five to 15 minutes in electric or gas infra-red ovens. (Usually applied by spraying) 141

Lo-Bake Enamels — Designed for baking in 15 to 30 minutes at 200° to 250° F. Excellent hardness, toughness, adhesion, durability and luster in all colors. Application by spraying or dipping 142

Hi-Bake Enamels—A full line of flat, rubber finish, semi-gloss and gloss black enamels, designed for lowest square foot coverage cost with maximum hardness, adhesion and durability, where high temperatures are available. Reduce about four to one with petroleum thinners for spraying and three to one with petroleum thinners for dipping. Bake one hour at 350°F., 30 minutes at 400°F., or 15 minutes at 450°F.....143

QS-471 — This enamel is an oleo-resinous base, gives excellent adhesion and flexibility, and may be had in all colors except pure white. When reduced with the properly selected naphtha, the material covers well in one coat by either spray or dip. This finish bakes out one hour at 275°F. This enamel may be spattered with a spatter coat of QS-471, after a base coat of contrast has been applied, to produce an attractive finish. This grade of enamel may be had in either gloss or semi-gloss.....115

Crist-L-Cote Enamels—Designed to produce the long popular, pleasing crystallized effect by baking in a foul gas oven. Can be placed directly into hot oven and baked one hour at 250° F., or 30 minutes at 280°F. Furnished in black and clear.....146

Alternate Wrinkle Finish—An available wrinkle finish has been established to replace the synthetic wrinkle previously supplied.....103

Wrinkle Enamels, QS-773 & S-272—Are made from an oleo-resinous base; are formulated to apply full-weight and bake for one hour at 275°F. The wrinkle texture is quite fine, and the luster is semi-gloss. This material may be had in all colors except white and pastel tints.....117

4A Sanitary Drum Lining — When properly applied and baked, it becomes hard, glass-like and insoluble in all known solvents. It is therefore, especially useful as a lining for packaging such strong solvents as alcohol, chloroform, acetone, varnish remover, nitrocellulose lacquer, thinners, etc.

Application is by spraying and it must be applied over well cleaned steel.

A quick flash of high heat should

be avoided in either a box or automatic drum oven. An increasing heat from room temperature to 400° or even 425°F. during a 25-minute cycle should accomplish complete conversion. This material yields a protective film only when baked as indicated above, and is wholly unsuited for air-dry, or low-temperature work.

Drums protected with 4A Lining, properly baked and aerated, are absolutely free from oleoresinous paint and lacquer odor, and smell much sweeter than a plain steel drum. In containers intended for use where extraordinary protection and complete coverage are required, two, three, or even four coat work may be done. Where more than one coat is applied, only the final coat should be baked as recommended above. Preliminary coats should be baked at temperatures in the neighborhood of 250° to 275°F. for 25 minutes. With the use of special equipment for application and baking, this lining may be applied in four to six coat work on 1000 to 20,000 gallon tanks used for dairy and beverage purposes.....151

No. 2300 Enamel—Formulated from a new base designed to give the same characteristics as alkyd resin enamels. This enamel reduces with hydrogenated naphtha for spray or dip application; bakes in one hour at 250° F., and may be had in all colors, including white. Adhesion, flexibility, color retention, resistance to heat-discoloration, and resistance to humid conditions are excellent.....116

"We finished 5½ million gas mask strap buckles in only six weeks by cutting out the bottle-neck in drying the lacquer", says George Welker, head of the Welker Mfg. Co., at Cromwell, Conn.

The bottle-neck was eliminated by the installation of eight Fostoria IR Para-Sphere reflectors, using 260-watt carbon filament lamps.

The process formerly required one hour and an attendant had to turn the trays (see small photo) and shake the buckles every 15 minutes. 1,500 buckles are now dried every two minutes without "lacquer blushing" or sticking.

The girl, wearing a glove, spreads the lacquer dipped buckles on a screen 18 inches below the lamps.

Twenty employes were added to the production and packing staff to keep pace with this speeded-up process. No increase in plant space was required for the radiant energy process. Photograph, courtesy Fostoria Pressed Steel Corporation.

Quick-Bake Enamels — Designed to replace more expensive and hard-to-get synthetic enamels that require scarce solvents for thinning. Bakes in 30 minutes or less at 300°F., or about one hour at 260°F. Contains no asphaltum. Reduces with petroleum thinners for application by spraying or dipping. Available in flat, rubber finish, semi-gloss and gloss black lusters 144

Rink-L-Cote Enamels — A line of wrinkle finishes made from readily available raw materials to produce uniform luster and character of pattern. Can be reduced about 10% with petroleum thinners for spraying. A great time saver in that freshly sprayed work can be placed directly in a hot oven. Bakes to a tough, adhesive, durable film in one hour at 250° F., or 30 minutes at 280° F.....145

AIR-DRY COATINGS FOR METAL

IN MANY cases there is more or less overlapping of the materials listed as strictly air-drying and those placed in the classification of bake finishes. A few materials can be used either way, producing a harder and more durable film when baked, of course. Also, it is possible that a few of those listed here as air-drying should be in the bake-finish classification—due to the fact that the manufacturer did not supply complete data on same.

Ham-R-Form Non-Metallic — Now available in baking and air-drying materials. The base color is applied and the 2-tone effect is accomplished by coloring the spatter thinner. In other words, Ham-R-Form is a one-coat, 2-operation finish.....175

New Luminum—An aluminum substitute with worlds of possibilities but, due to priority restrictions on certain essential raw materials, available quantities are limited. New Luminum is an absolute metallic finish, not quite so brilliant or fine as aluminum, but a very acceptable substitute 163

No. 22 Red Crankcase Sealer—An unusual and special product, designed for application by spraying or dipping on interior and exterior surfaces of motor blocks, Diesel engines, crankcases and other castings, to seal in the sand. Resistance to hot lubricating oil, caustic cleaning solutions, water, etc. Can be machined without chipping back or gumming up machinery tools. Several hundred thousand gallons used annually by many large consumers.....147

S-53—An air-drying finish that sets out-of-dust quickly, and is dry and hard to pack overnight.....113

Heat-Resisting Finish, RX 8404 — A fast, air-drying finish for application to furnace fronts, heater parts and other heating and ventilating requirements to replace a heat-resisting aluminum finish 104

There is only one way to end these shortages and these painful readjustments, and that is to end the national emergency itself. The way out of our troubles is right straight through them. The heavier the load we take now, the shorter will be the time we have to carry it.

Because there will not be enough of certain metals to keep everybody going, producers for the civilian trade who use these scarce materials, must cut down. Substitution and redesigning may prove profitable outs.—A. J. Browning.

Galvanizing Substitute — Zinc shortages have curtailed the galvanizing operation, making it necessary to apply protective coatings. Many formulations have been tested as a comparable finish to galvanizing but different requirements demand individual formulations 101

Raven Speed Black No. 93 Gloss and Raven Speed Dull Black No. 59—Are released as alternates for former materials that used critical synthetic resins. The new products are, in this instance, an improvement; they dry as fast and are tougher. These two materials are created as a general purpose black wherever very fast handling, spray or dip, material is wanted. When sprayed it is dry to handle in three to five minutes time. It is used as received and is low in price 176

Non-Metallic Hamercote—A strictly new development to be used in the usual manner by applying a base coat through one spray gun and then splattering with another spray gun to produce a hammered or varigated effect. This new material does not contain aluminum, copper, gold or other metallic powders, which are now almost unobtainable, yet it gives results very similar to the customary hammered finishes.....148

PROTECTIVE COATINGS FOR FURNITURE

NITROCELLULOSE lacquers and many types of synthetic coatings which, in 1941 had reached such a high state of development and which were being used so extensively in the finishing of furniture, radio cabinets, pianos and wood fixtures, are now practically out of the picture. At any rate, they are supposed to be either unobtainable or very difficult to get for use on anything other than defense production. Where and if they are being obtained, it is probably in limited quantities and for a limited length of time. However, supplies of substitute or alternate materials have been made available. Alternate materials, when supplied by reputable manufacturers, are satisfactory as protective coatings. Naturally, some of them lack certain desirable characteristics, but they can be used and are being used. In a few cases certain alternate materials equal and even surpass in quality the materials they have replaced. The future will certainly give us more new developments in various coatings made from raw materials procurable on the North American continent.

We feel that our flat varnish and sealer varnish are becoming increasingly useful to the furniture trade because of the scarcity of lacquers and sealers and also because of the fact that they greatly reduce cost of finishing when the market is rising rapidly and every penny saved helps that much.—P. P. & C. Co.

Stain Bleach — A one-liquid bleach that will remove the old stains on refinish jobs very quickly and will restore the original color of the wood. This product also is very effective for removing stains from finishers' hands as it is non-corrosive.....131

LS-048 Sealer; LS-062 Gloss Varnish; LS-063 Flat Varnish—These three materials are designed to be used in conjunction with each other for finishing furniture and other wooden surfaces. They approach the hardness, toughness, clarity, and alcohol & water resistance of a lacquer finish but are made from more easily obtainable raw materials. The sealer

To meet the present emergency for Defense and Non-Defense industries, we have gone a long way in the development of finishes to take the place of galvanized metal, and we also have well advanced formulas for varnish sealers, rubbing varnishes and flat varnishes to take the place of lacquers when they are no longer available. We have also been able in many instances to make enamels that have proven satisfactory from which the most critical raw materials have been removed.....179

can be sanded in 30 minutes to an hour. One or two coats of the gloss or flat varnish can be applied in a single day and either of them can be rubbed and polished to a very clear film after drying 24 to 48 hours. All materials set "out of dust" in 30 minutes or less.....149

62-A Sealer; 63-A Building Coater; 65-A Rubbing & Polishing Coater—These materials are designed especially for conveyor finishing of furniture and other wooden articles to replace hard-to-get lacquers. The sealer can be sanded 30 minutes after it is applied; the building coater can be sanded while still warm after force drying about two hours at 130°F.; and the rubbing & polishing coater can be force-dried about two hours at 130°F., and will be hard enough the next morning to rub and polish to a clear transparent film; or all materials can be air-dried a day between coats. Spreads much further and gives more body than lacquer. Hard, tough, print-proof, non-cracking, clear and transparent 150

Speed-Dry Varnish—As a replacement for clear lacquer in the furniture field No. 70 Speed-Dry Varnish Gloss and No. 42 Speed-Dry Varnish Semi-Gloss are worthy of attention. They are higher in solids than lacquer. Two coats may be applied the same day. Rubbing and polishing can be done after overnight drying.....174

Alcohol-Proof Lacquer—This lacquer is made especially to stand alcohol and is exceptionally fine for weather resistance. It carries very good body, is made in both gloss and semi-bright, and is very flexible and durable.....168

Monobleach—One unit only—no mixing or matching of No. 1 and No. 2. A new development of tested and proven quality.....158

No. 1900 Wateroil Clean-Up Polish—Absolutely the finest clean-up polish obtainable for eliminating the bluish bloom or haze from new finishes. Also eliminates finger marking and dust collecting, miscible with water—economical and outstanding.....164

Dubar Bleach—Internationally known and accepted as a splendid product. Sold with an absolute guarantee of satisfaction. Owing to scarcity of raw materials, available supply is strictly limited 165

Tops—A blend of synthetic resins, cotton and solvents which produce a heavy-bodied tough quick-drying finish quite different from the usual furniture finish.....161

Edge Stain—Edge stain is an aniline color in solid block form that greatly simplifies the coloring of rubbed-through edges. No brushes are necessary. The block is simply rubbed on the edge and it leaves a color instantly 132

E. C. Wood Lacquers—Many users of nitrocellulose lacquers have been compelled to turn to other types of finishes due to the shortage of solvents, thinners and other new materials. Ethyl cellulose wood lacquers are growing in popularity and we are now offering a complete line of not only clear lacquers and sealers but also undercoats and lacquer enamels, all based on this new type of cellulose. As the solvents necessary to

make ethyl cellulose lacquers and lacquer enamels are available in much larger quantities than those necessary to make nitrocellulose lacquers, the user of ethyl cellulose lacquers can feel more certain of getting them when he wants them and in the quantity that he needs.....134

4-Hour Drying Type Varnish—An extensive line of the 4-hour drying type varnishes which, in some instances, have been replacing the final lacquer applications. These varnishes dry exceptionally fast and hard, carry excellent body, and may be kiln dried to save time.....170

Super Kamex Enamels—Super Kamex Varnish has been an outstanding product during the past year, as it has the drying speed of lacquer with twice the solid content. We are now offering undercoats, gloss and flat enamels based on this vehicle. These enamels dry as quickly as lacquer yet build like synthetic and varnish type enamels. They cost less to use than lacquers and are available in unlimited amounts.....133

Synthetic Waterproof Flat Varnish—Made by an entirely new and different process in flat varnish manufacture. The manufacturer chemically treats fossil gums so as to produce a dead flat finish. This flat is then blended with gloss varnish to get the desired sheen, so that it is not necessary to use stearates, resinates or other foreign flattening agents usually found in the conventional type of flat varnish. This process gives a material that offers the following merits:

1) A beautiful rubbed-effect appearance.

2) Waterproofness and liquor-proofness.

3) A finish free from orange peel.

4) Sheen doesn't change upon standing.

5) The finish is perfectly clear, bringing out the utmost in the beauty of the wood and stain.

This material dries at room temperature in 24 hours; overnight at 110°F.; or in two hours at 145°F.....128

Shading Stain—Blends perfectly without producing opaque or clouded finishes. Instantaneous drying and non-fading 166

Vindolac—A new product developed during the past year. Formulated to meet the most exacting requirements in the lacquer field. Vindolac is a 27% licensed lacquer which, according to laboratory test, will withstand hot

While we have known for some time that certain materials will be denied us, most of these substitutions are in the future rather than in present use. The paint industry, as you know, works considerably ahead of immediate requirements with the result that most of us still have the old formulas for present use.—R. J. F.

Probably no situation since the elimination of German aniline dyes during the first World War has provided such a stimulus to research. Finishing material manufacturers are working frantically to find substitutes for these unattainable raw materials. Alternate materials are coming out of the laboratories—slowly. Rome wasn't built in a day. These substitute materials will mean, for some time to come, an enforced sacrifice in many essential properties in organic finishes. Hardness, speed, water resistance, toughness, etc., will all not be up to par in these substitute materials.

Necessity being the mother of invention it is inevitable that the present emergency will force a development in the industry generally, from the research standpoint, that we would not have attained normally in many years.—W. T. Smith.

and cold checking for a greater number of cycles than any competitive product we have ever encountered. Quick drying, heavy bodied, tough—yet it produces that smooth soft feel so much desired in furniture finishes 159

B. B. Primer—A first coater that for inexpensive and cheap work has great value as a replacement for lacquer sealer. It will produce a full-body foundation and may be coated over with varnish or lacquer after drying from four to six hours. It is produced from certain raw materials that at the present time appear to be available without too many restrictions. It belongs to the oil varnish type and enables the finishing applications to stand out in a full and bold manner.....171

Alternate Furniture Varnishes & Sealers—Raw material shortages have handicapped the furniture manufacturers and, realizing this condition, our laboratories have developed a line of rubbing and polishing varnishes which can be fitted into most all old finishing schedules employing either lacquer or varnish.

The same raw material shortages have involved lacquer sealers, but our No. 33 and No. 5517 sealers have been successfully tested in a number of furniture shops and have satisfactory drying, sanding, build, and holding out characteristics.....100

Perfection Sealer Varnishes — Made of gum and this gives better adhesion, greater coverage and infinitely more toughness. The sanding is like that of lacquer sealer. In spraying sealer varnish, it is better to use a thin coat. Nothing can happen if a heavier coat is applied except that you are wasting the material and retarding its drying by using more than necessary. Since this material has from two to three times the solid content of lacquer sealer, you can readily see that a heavy coat is not desirable or necessary. Sealer is dry to sand overnight at room temperature; in two hours at 100°F., or in 50 to 60 minutes at 145°F. 129

OTHER COATINGS, PROTECTIVE & DECORATIVE

INCLUDED in this miscellaneous list is a variety of coating materials most of which do not fit appropriately under any of the other classifications. Those that perhaps should be listed elsewhere were received too late to be so classified.

Pearl Essence—A beautiful lustrous finish adopted by many of the nations' outstanding manufacturers. Produces a beautiful finish for caskets, cabinets and various novelties.....162

Webbing Lacquer—Much has been written about this item, and its unusual properties. With webbing lacquer it is possible to spray a marbleized effect of unusual beauty and close proximity to genuine marble. Most unusual effects can be produced through its application, but unfortunately the exceptional demand, coupled with the limited availability of raw materials, now makes it impossible to take on additional orders for this item 160

S-66—This is a clear synthetic-base protective coating for fiber, paper mache, bisque and other composition articles. It dries out of dust quickly, and overnight to pack. It has excellent qualities of water resistance....114

Electrical Varnish (Ajax Clear High-Bake Varnish, RX 02095)—The electrical industry has uses for a varnish that will dry by baking in the absence of air. Such a varnish is applicable to motors, generators, armatures or coils that are subjected to high speeds, vibration or high operating temperatures.

While the old type oleo-resinous

We are prepared to show that building trim, plywood paneling, etc., can be given a desirable light color with very great durability by bleaching the wood with "Blanchit", and finishing with a penetrating and waterproofing one-coat protective finishing material. The plywood and other wood surfaces would be mar-proof, and very readily cleaned. There will be no pigmented materials to flake and scratch off, or show abrasion from use.

The main items of value, of course, in this recommended procedure would be the saving of labor cost, as compared to two or three-coat paint or enamel finishes, which are now given to obtain light-colored interior finishing. Both building contractors having Government or private enterprise housing projects for completion should be interested; also, those finishing material manufacturers who are producing a product that fills the requirement of the protective coating mentioned above will probably value the suggestion . . .—L. R. V. A. Co.

varnishes may show satisfactory internal drying, cementing, bonding and mechanical strength, they generally show the fault of resoftening under operating temperatures and in some cases cause throw-outs of the varnish or warpage of the coils that result in a short circuit.

The baked film of RX 02095 has good water resistance, both hot and cold, very good oil resistance, will withstand strong mineral acids in concentrations equal to that in batteries, and further it shows satisfactory resistance to salt spray or salt solutions.

This varnish can be baked by infrared on electrical parts that are of such design and weight as to permit the temperature to be 275°F. or above, by means of infra-red lamps. Considerable advantage in time saving has been gained by the use of RX 02095 where infra-red baking of parts was followed 106

Flock Possibilities—For defense and civilian items, flock has many merits, for example: 1) no shortage of flock styles; 2) ease and speed of application; 3) soft fabric-like effects; and 4) dull finishes obtainable for defense work.

Flock styles can be obtained in rayon and cotton to furnish pile or suede effects for uses where a softer finish is desired, where a fabric must be replaced, as well as where elimination of light reflection is a factor in camouflage work..... 130

Alternate Venetian Blind Formulas—Previous venetian blind formulations have involved critical raw materials such as titanium dioxide and synthetic varnishes. Without sacrificing durability or working characteristics we have an alternate quality line available 102

Ski Lacquer—Made especially for coatings on skis and will stand very rugged usage. It is the toughest and most flexible lacquer we have ever tested. It is also alcohol-proof and will resist the weather elements excellently 169

Practically all development work that was started during the early part of 1941 was discontinued some months ago. Several promising new developments can not now be used because of material shortages. Present development is almost entirely a search for available substitutes. Most of them are stop-gaps not to be publicized. Many of them are so recent that we are not ready to present them to the industry as a whole.

Coating Shells Inside and Outside

THE accompanying illustration shows a shell-coating unit in the plant of Edw. G. Budd Co., Philadelphia, Penna. Referring to the picture, at the right you see a semi-automatic unit for coating the interiors of 37-mm. shells. This unit has three guns and operates as follows:

The operator inserts the shell in one of the cup fixtures and depresses the fixture momentarily. This opens the automatic off-and-on control, operating the airbrush which sprays the interior. When the shell is removed, the spray shuts off instantly. The weight of the shell itself will depress the fixture, and this reduces to a minimum any physical effort on the part of the operator.

This type of unit is applicable for spraying the interiors of 20-mm., 37-mm. and 40-mm. shells of various types. This equipment can also be used for coating interior pieces other than shells. It can be made with one, two, three or more guns, as necessary. It is simple to operate, effective and requires a minimum of maintenance.

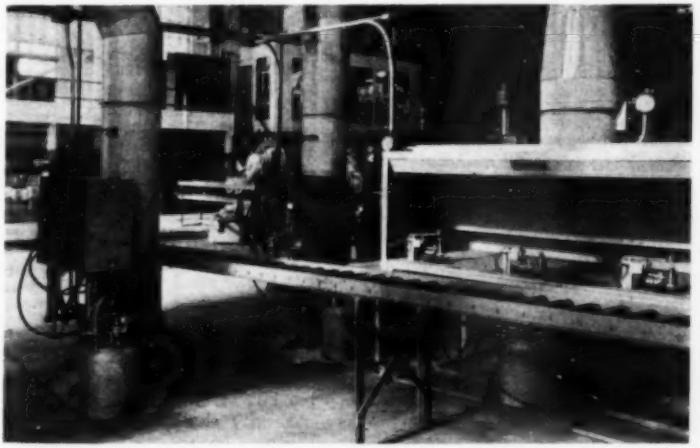
Material is supplied to both the interior coating unit and the exterior coating units from "clamp-tight cover" material feed tanks.

At the left, in the picture, are two turntable-type units for painting the exteriors of these shells. Shells are loaded and unloaded manually. The manufacturer's specifications on a unit of this type, state that production averages 17 pieces per minute.

The exhaust system includes a water-wash type of chamber, as shown at left.

Article and photo supplied by courtesy of Paasche Airbrush Co.

Men, plus machines, control production. Even now, the output of any plant depends on the speed and accuracy of machine operators.



Semi-automatic equipment for spray-painting interiors and exteriors of 37-mm. shells.

Bomb and Shell Painting

By W. H. ROHR, Editor

Right: The four automatic spray painting machines and ovens in Loading Line I. Photographs, courtesy of DeVilbiss Co.

THE HUGE, new, $60,000,000.00 Iowa Ordnance Plant near Burlington, which sprawls over 35 square miles of what was but recently quiet farm land, is now in operation. Though work on its permanent structures did not start until the middle of last January, it was practically completed by midsummer—a feat all the more astonishing when one realizes that the project includes almost 700 buildings, more than 100 miles of highway, 77 miles of railroad, and an electric generating station big enough to supply all of the power needed in the plant's operation.

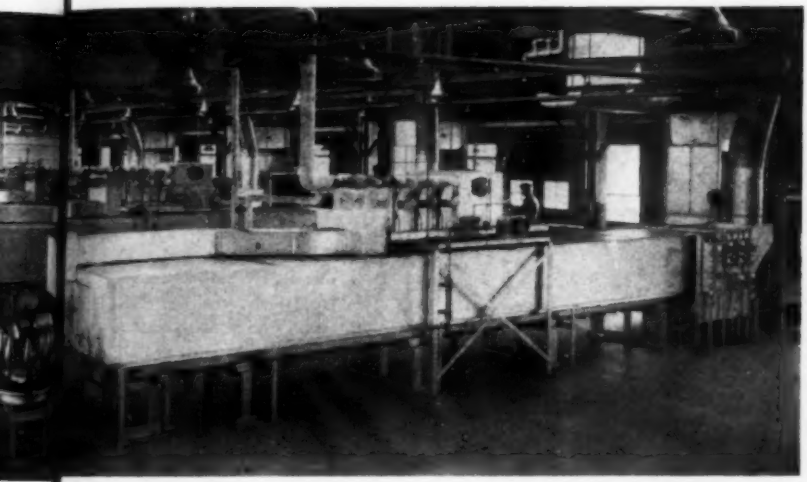
Lt. Col. Otto M. Jank, Commanding Officer, and Major John C. Lowry, Constructing Quartermaster, were responsible for the supervision of the construction program. Day and Zimmerman, Inc., Philadelphia, consulting engineers, designed the plant, purchased all equipment and materials needed, and now operate it. A. Guthrie and Co., St. Paul, and the Al Johnson Co., Minneapolis, were the general construction contractors.

Loading Station for Shells and Bombs

The Iowa Ordnance Plant is a loading station for shells and bombs. Here the empty metal bodies are shipped from various forging works throughout the country to be filled with molten TNT and to be fitted with the fuse, detonator, and booster mechanism—the "explosive train" which is necessary to detonate the relatively stable but terrifically powerful TNT.

Empty shells and bombs arrive at the Iowa plant painted on the inside with an acid-resistant sub-

ing at Iowa Ordnance Plant



stance and, on the outside, with a protective primer. Then, before they are loaded, all exterior surfaces except rifling bands are given a finish coat of lacquer enamel.

This painting of shells and bombs is exceedingly important; it prevents deterioration due either to the corrosive action of the charge or to rusting during storage, which may be for a period of years in warehouses or in ammunition dumps.

Line 1—Four Automatic Spray Painting Machines

Twelve hours or more before they are to be painted, the shell and bomb bodies enter the painting shops in box cars. This gives them sufficient time to come up to room temperature, a requisite to the satisfactory application of the lacquer. Next, the projectiles are placed on the spindle conveyors of the spray machines. Flanged metal masking rings are dropped over the rifling band to keep those precisely machined parts free of paint.

Thread shields are placed in the fuse openings of the shells and bombs which ride nose-end up on the spray machine conveyors. The projectiles which ride nose-end down need no fuse thread shields, for they are protected in those sections by the workholders. Then the bombs and shells are automatically painted and force-dried.

The four spray machines on *Line 1* have a total painting capacity of nearly 100,000 units every 24 hours.

On each, the spray station is equipped with four automatically actuated guns. As each shell or bomb reaches an "index" point about midway through the spray station, it is momentarily halted in its lateral travel and begins to rotate. Then the spray guns automatically open and spray all exposed surfaces of the projectiles.

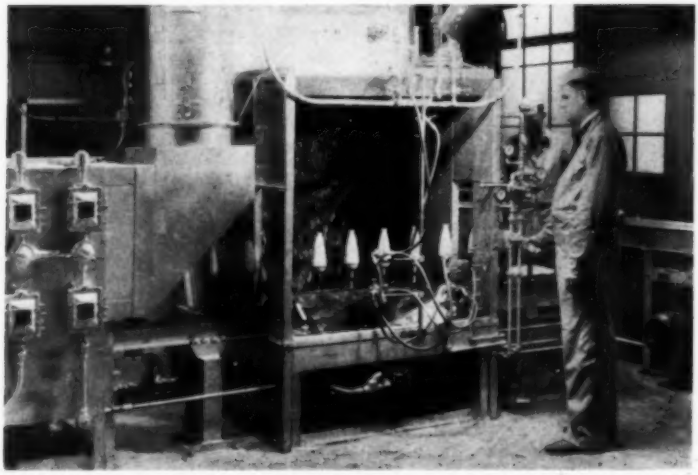
These spray guns are so controlled that they will not spray empty spindles. This prevents the fouling with paint of the holding part of unloaded workholders, which must always be kept clean to avoid consequent fouling of the nose fuse threads. This feature also prevents the wastage of paint in spraying empty spindles and gives the operators a chance to skip spindles when desired or to leave the machines when necessary without stopping them.

The conveyor on each machine travels 12-ft. per minute and is over 171-ft. long. About 94-ft. of it weaves back and forth through a 32-ft. drying oven heated to 150° F. by steam.

All of these conveyors are the chain-on-edge-type which moves on extended side bars that slide along on a lubricated track. Sturdy, vertical spindles, on which the workholders are placed, are mounted on the chains every 8-in., and are rotated during passage through the spray stations. They turn on tapered roller bearings and their rate of rotation is adjustable from 300 to 420 revolutions per minute, so that each size and kind of shell and bomb load on *Line 1* can be most effectively coated.

Water-Wash Spray Booths Are Well Ventilated

The spray guns on each machine are located in a spray booth equipped with an elevated nozzle-type water-wash chamber. This water-



One of the four automatic spray-painting machines in operation on Loading Line No. 1.

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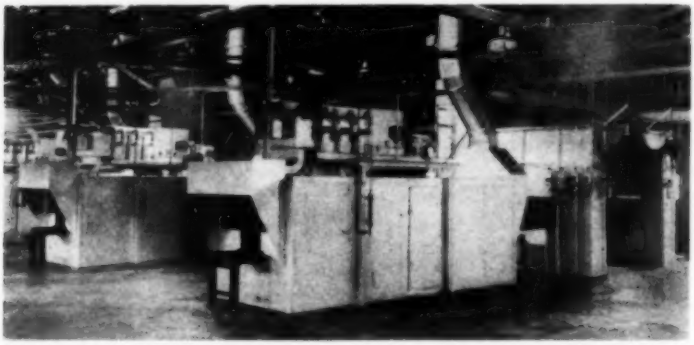

View of the three hand-spray booths and drying ovens on Loading Line No. 2. The roller conveyors at the discharge end of the ovens had not yet been connected to the main conveyor, nor had the conveyors been installed in the booths, when this picture was taken.

wash chamber provides a remarkably efficient and safe type of exhaust for an installation of this kind. It prevents the accumulation of paint in the stack, with its ever present danger of combustion, and it safeguards the health of workers by preventing contamination of the atmosphere by paint dust.

Air is kept moving through machine booth openings at a velocity of 250 lineal feet per minute by means of a motor-driven fan installed in the stack of each booth, outside the building, with the motor in weather-proof housing. Oven fumes are also carried to the outside. For that purpose, the duct from each oven is fitted with a small fan which is aided by the convection currents in the oven.

Line 2—Both Automatic and Hand Spraying

The shells are painted by three automatic machines. Bombs, however, because of their greater weight and unwieldly size, are hand sprayed in three water-wash booths.

The three automatic machines on *Line 2* are similar to those on *Line 1*, differing only in the spacing and rate of revolution of the spindles, the speed and length of the conveyors, the number of spray guns, the length of the ovens, the size of the booths and exhaust fans, the structural strength, and the resultant production rate. These differences are necessary, of course, in order to insure efficient coating of shells in the larger calibers and heavier weights loaded on *Line 2*.

Larger Shells on Line 2

Each of the three automatic machines has a capacity of over 7,000 shells every 24 hours. Here the spindles' rate of rotation is adjustable from 60 to 110 revolutions per minute and their spacing is 16-in. Each conveyor is 145-ft. long and moves 7-ft. per minute. Six spray guns are installed at each spray station and the ovens, because of the slower conveyer speed, are only 19-ft. long.

The booths on *Line 2* machines are larger than those on *Line 1*

★ ★ ★ ★ ★ ★ ★ ★ ★

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BERRY BROTHERS factories are working day and night to contribute to the strength of America, but we want to do more!

Our production of airplane finishes is geared to the aircraft industry to prevent bottlenecks, which would obstruct the flow of bombers and fighter planes from production lines.

We are determined to add every ounce of our strength to America's all-out defense effort. The United States can have as much of our plant capacity as it needs.

If your problem is to speed up the flow of protective coatings to your production lines, consult us. We will help you all we can.

We are set up to produce, in volume, paints for tanks — trucks — shells — land mines — bombs — bomb cases — machine tools. Lacquers to all specifications. Berry Brothers is "all out" for America!

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machines, because six instead of four guns are installed at each spray station. Therefore, larger fan motors were installed to provide the desired exhaust velocity of 250 lineal feet per minute.

Booths for Hand Spraying Large Bombs

The three hand spray booths are 10-ft.4-in. wide by 8-ft.2-in. high by 11-ft.6-in. deep. Beside each is an 18-ft.4-in. oven similar in design to the dryers on the automatic machines. The exhaust air from the booths is cleaned in elevated nozzle-type water washers and is pulled through the booth openings at a speed of 150 lineal feet per minute. This lower exhaust rate is sufficient, for only two guns are used in each booth, the frontal opening of which is several times the area of that of each machine booth.

Bombs move through each booth on sawhorse-like workholders attached to rectangular bases, which slide along on roller conveyors, and are sprayed by two operators. The spray equipment at each booth consists of two production type spray guns, two air transformers which clean the compressed air and regulate its pressure, two gun hangers, several lengths of air and fluid hose, and all the necessary fittings, valves, etc.

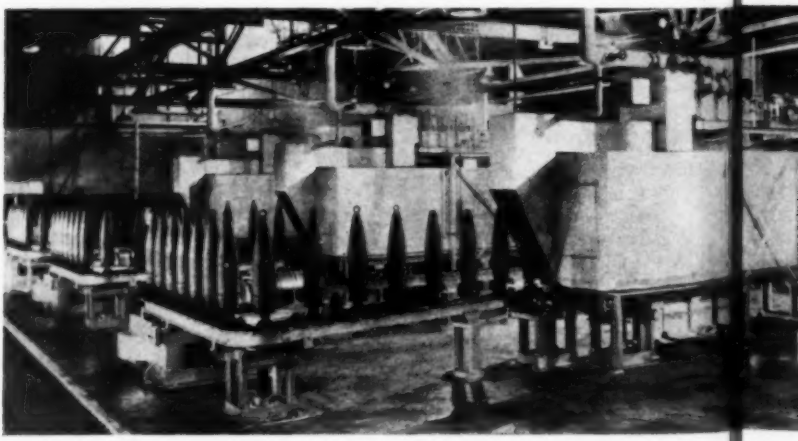
Loading Lines 3 and 3A

Loading *Line 3* includes three water-wash spray booths and oven assemblies. These are hand spray booths. Except for the size of side work-openings, the booths are the same as used for hand spraying on *Line 2*.

Another line, designated as *3-A*, to paint and load the same sizes of bombs that are handled on *Line 3*, is now under construction. In this building will be installed two water-wash booths with hand spray equipment identical in all respects to those used on *Line 3*.

Three Paint-Circulating Systems

Separate single line paint circulating systems for each load line have been installed to carry the



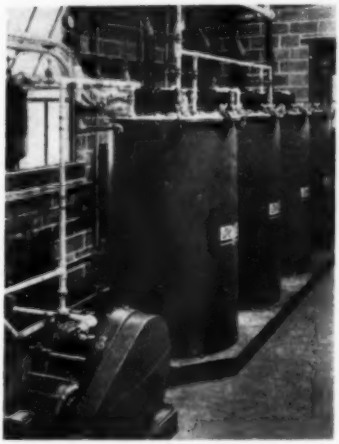
lacquer enamel to all automatic and manual spray stations. Mixing rooms for each system are housed in fireproof enclosures located apart from the areas in which painting takes place.

Four 120-gallon mixing tanks with electrically driven agitators and two pumps—so connected that material from any or all tanks can be circulated by either or both pumps — comprise (with the pipe loops, fluid pressure regulators, and accessory equipment) each system. Thus each hook-up is actually a double system and half can be held in reserve as a standby.

Safety Precautions—Pumps, Tanks, Filters, Gauges

The pumps are especially engineered for moving hazardous liquids. Tank lids, though hinged, are vapor-proof. Each tank is vented, through pipe, to the outside, thus preventing the discharge of trapped vapors into the mixing room whenever the lids are raised.

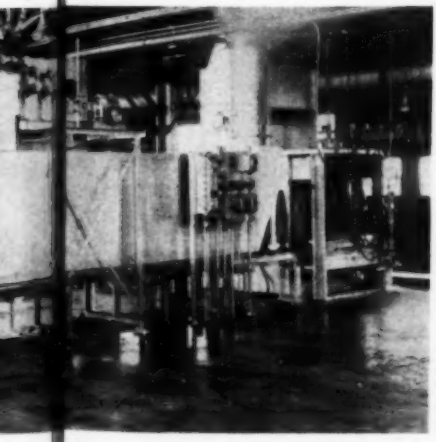
Filters with easily cleanable elements are located in the paint lines and all fluid pressure gauges are pulsation-proof, which keeps the gauge needles steady—a necessity for accurate pressure readings. Relief and by-pass valves installed in the pipe loops reduce the pump loads to a minimum and prevent damage to the system in the event of clogging.



Each of the three loading lines has its own paint circulating system. This is the storage and pumping room for one system.

Vapor-Proof Light Fixtures

All spray booths on all load lines —for both automatic and hand spraying—have vapor-proof lighting fixtures which brilliantly illuminate the spraying operations. All electrical fittings and controls on all spray machines and booths and all conveyor and spindle drive,



Left—The three automatic spray machines on Loading Line No. 2. After shells leave the ovens, the fuse-thread masks are then removed and rings with threaded bases are screwed into the fuse openings. These rings serve as holding devices when the shells are later hung to an overhead conveyor.

water washer and circulating system pump, mixing-tank agitator, and oven-fan motors are explosion-proof and are approved by the Underwriters' Laboratory for extremely hazardous locations such as this.

The new Iowa Ordnance Plant is light, airy, spacious, and immaculately clean. It employs color freely with the result that the employes have the benefit of a bright and cheerful atmosphere while at work. And, equally important, the color is employed as an identification system to denote function—a real contribution to the plant's efficiency.

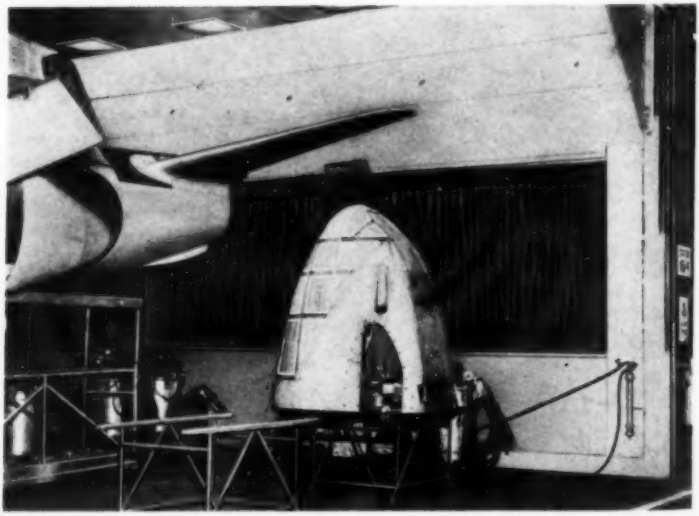
All paint-circulating system pipes are painted yellow with two blue bands every 24-in. All air lines are blue, water pipes plain yellow, structural steel maroon, and sprinkler lines bright red. The automatic spray machines, ovens, and spray booths are painted aluminum.

We have been able to develop infra-bake finishes, eliminating the use of critical synthetic resins. The baking time in infra-red tunnels having 260-watt lamps has not materially increased, averaging six to eight minutes; black less.....177

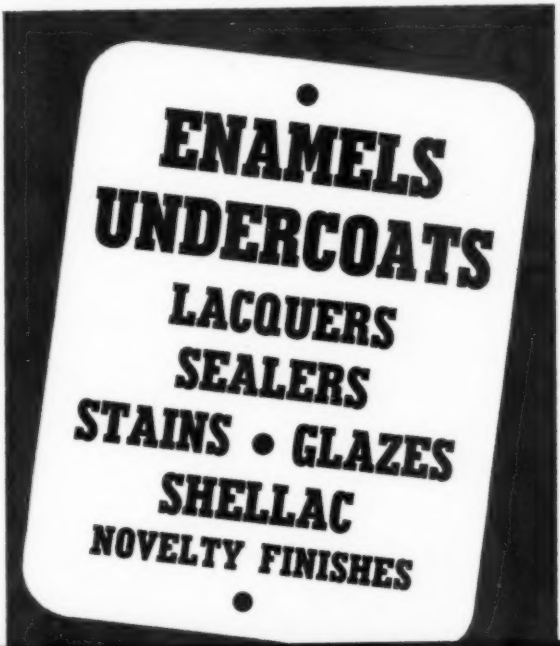
The floors, which are kept waxed and highly polished to facilitate the removal of dust, are brick red. The walls are made of glazed brick.

All shell and bomb-painting equipment was especially engineered and fabricated for the project by The DeVilbiss Co., Toledo, Ohio, who also supervised its installation and initial operation. It meets or exceeds, in every respect, all underwriters', state and local safety regulations.

Title to the entire plant rests with the U. S. Government.



Dynaprecipitor water-wash spray booth used in the spraying of the fast Douglas bombers at the Douglas Aircraft plant at Santa Monica, Calif. Photo, courtesy of Binks Mfg. Co.



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are used for masking work in process, and for protecting it during shipment—particularly military aircraft, tanks, etc.

LET'S take a trip 25,000 miles around the world and see how industrial tape serves in various important ways on the fighting fronts. Our trip begins at an Army arsenal in New York. The tape experts hadn't guaranteed waterproof qualities. Yet, after the Army men had sealed a shell-container with this simple cloth-backed tape, they sunk the container in the muddy waters of the Hudson. A month later they fished it up. Would the shell fire? They loaded a gun with it. The gun was fired and a half-mile away the target crumbled. The tape had stood up.

Parts of Tanks Protected During Long Sea Trip

Let's go now to the Mediterranean where it's dawn on the Libyan desert. Bits of sand are flying about. See those tough Australian tank officers. They are preparing to attack the enemy. Thirty-seven minutes later their tanks roar out in a whirl of dust and sand. When the reports are wirelessed in, the experts agree. The prime physical condition of the United States made tanks is an important factor in the Battle of the Desert.

Those tanks traveled thousands of miles. Across the Atlantic, across the Pacific, down the African Coast, up the Red Sea, through the dangerous Suez Canal; ships of all nations brought these tanks to the soldiers of the British Middle Eastern Command. What protected these tanks from salt air and salt water, the deadly combination that corrodes metal, eats slowly

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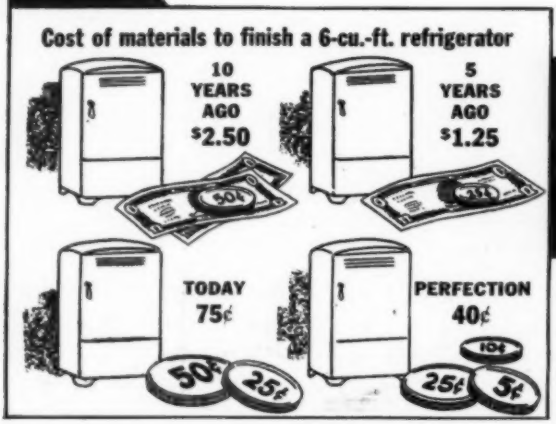
1. THIS COSTS $10.00 AN HOUR FOR THE MATERIALS ALONE

▶ If a modern spray gun is opened wide for an hour, it will spray out about $10.00 worth of materials (based on synthetic paint @ $2.25-$2.50 per gal.). With other type materials this cost might run up as high as $25.00 per hour.



2. HOW ONE INDUSTRY HAS SAVED ON MATERIALS

Some of these economies came from improved formulas and lower prices for materials. But the biggest savings have come through better painting technique. Of course, 100% efficiency is just a goal to shoot for. But regardless of what you finish... you, too, can save money by improving technique.

3. NOW'S THE TI... MATE...

When all industry ...ces sh... servation means more th... What's more, improved te... important when they also ... improved finishing techni... savings later on, too.

ONOMIES . . . *from the Du Pont man*

'S TIME TO CONSERVE MATERIALS

dustry faces shortages of materials, con-
neans more than money-saving alone.
e, improved techniques become doubly
when they also conserve man power. And
nishing technique will insure continuous
r on, too.

CHECK THESE 11 POINTS TO SAVE MATERIALS

NEXT MONTH READ ABOUT

1. Temperature of paint
2. Viscosity of paint
3. Air and fluid pressures
4. Adjustment of spray gun
5. Handling of spray gun
6. Triggering of the gun
7. System in the strokes
8. Uniformity of coating
9. Thickness of film
10. Causes of the rejects
11. Touch-up procedure

● The Du Pont man can show you how to control these factors . . . can aid you in conserving finishing materials and lowering painting costs. And remember—he's backed by a vast chemical organization with the finest of facilities for developing, making and applying better industrial finishes. When the Du Pont Man calls on you—call on him for help. E. I. du Pont de Nemours & Co. (Inc.), Finishes Division, Wilmington, Del.

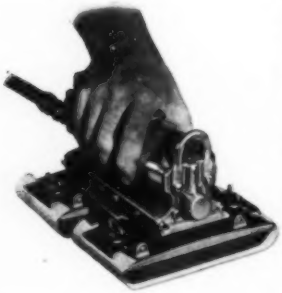
Look for detailed discussion of each point in a monthly series to follow.

FINISHING SUGGESTIONS
THAT WILL REDUCE YOUR COSTS

FREE
SEND FOR YOUR COPY

SEND for this new timely bulletin which explains and illustrates how finishing operations are speeded up and made less costly through the use of Sundstrand's latest model portable sanding and rubbing machines.

The remarkable results these machines have accomplished can be duplicated in your factory too. They are designed, built and tested for long hard service, working on all varieties of coated and uncoated surfaces such as wood, metal, composition material, fiber and plastic.



Only Sundstrand manufactures Opposed Pad Sanders. Vibrationless in operation, these machines are flexible in application, have greater abrasive area and quick change sandpaper holding device.

Sandpaper attachments of various sizes of oil and water resistant materials are available for practically all types of finishing operations.

TWENTY-FIVE years in the manufacture and installation of pneumatic machines has given us a comprehensive knowledge of finishing problems. Without obligation, Sundstrand engineers with qualified finishing experience will be glad to call and make recommendations on any of your sanding problems. Just write, and we will send our nearest representative.

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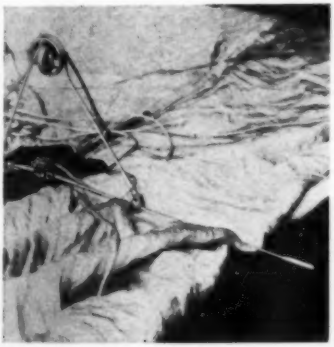
PNEUMATIC MACHINE DIVISION
2531 ELEVENTH ST. ROCKFORD, ILL.

away at vital parts? Tough, bakelite-backed utility tape that sticks at a touch, is the answer. Yards and yards of it were wrapped around the vulnerable parts of the tank. It helped American tanks arrive in Libya ready to fight, ready to pound across the desert in perfect condition.

Aircraft Masking and Protection Requires More Industrial Tape

Shift the scene to a lonely airport in England. United States fighter planes take off to combat the menace of Heinkel bombers. Utility tape helped protect these fighters against the same combination of sea air and sea water in the cold and dangerous crossing of the North Atlantic.

Come back to the United States now. Visit some of the United States bomber plants and watch production of these multi-engined menaces to the Mikado. Fusilages must be painted. The colorful stars that identify U. S. bombers, to protect them from their own anti-aircraft fire, must be painted on.



Notice how the end of the metal spring in this parachute mechanism is carefully taped to prevent damage to the 'chute.

Everything possible must be done to speed this craft on its way across the Pacific. How to do it quickly? Paper-backed adhesive tape sticks at a touch to the fabric, outlines the pattern. The design is painted on. The masking tape is zipped off without a moment's loss of time and the assembly line moves forward.

It's a sunny day in Virginia—a little too windy perhaps for parachuting, but the courageous paratroops of Uncle Sam's new army must be prepared to meet all conditions. Twelve men are crouched in the fusilage of a big transport plane. The sergeant gives the order: "O. K., let's jump. Happy landing!" One by one the men bail out. A small pilot chute, released by a slight metal spring, allows the voluminous silk folds of the main parachute to billow out. Swaying in the wind, desperately pulling on the lines to guide the chute to the right landing place, those men are sure that every precaution has been taken to insure their safety. And to make sure that the metal spring doesn't rip the main chute, that spring is carefully taped and it's rough edges smoothed against the possibility of tearing the silk.

Really, masking tape does play an important and timely role today. From protecting tanks against salt water to protecting furniture from scratches, from speeding bombers on their way to Manila to masking finishing work for civilian production, adhesive tapes are helping carry forward the Victory program.

Editor's Note: Illustrations and facts for this article were sent in through courtesy of the Industrial Tape Corp., New Brunswick, N. J.

What Finishes We Have

AVAILABLE FOR DEFENSE AND CIVILIAN NEEDS

BY H. W. CHESTER
Foreman Finisher

DURING the past year there has developed a very serious shortage of certain essential raw materials used in the manufacture of protective coatings. This has been brought about because of four things:

1) The use of large quantities of these materials for coating defense products.

2) Greatly accelerated production of civilian products on which these coatings are used.

3) The use of many synthetic-basic raw materials such as solvents, phenol, glycerine, formaldehyde, etc., for direct defense needs of explosives, antiseptic solutions, etc.

4) Many users of finishing materials have become alarmed over a contemplated shortage and hence have over-stocked and perhaps, in some cases, hoarded these materials.

Many Interesting Substitutes Will Appear and Be Used

While the protective-coatings industry is today confronted by an uncertainty that no foresight can possibly penetrate very deeply, I am sure that for those materials that will not be obtainable, we will be able to secure substitutes which will, in most cases, work as well and perhaps in some cases even better than the materials they are replacing. On the whole, however, the substitute materials will probably dry slower, be less print-resistant and softer.

I believe that from the laboratories of the great army of competent chemists employed by the finish manufacturers, will come new and better protective coatings —coatings that we will continue to use after the present World War II is over, because they will be superior to many of the coatings we use today.

While defense and war activities will and should come first, most users of finishing materials in the non-defense industries have been and are still able to secure enough for their present needs. Synthetic varnishes are available and I understand that most manufacturers still have from three to six months' supply of these resins on hand, but after this supply is exhausted they don't know how much more they will be able to obtain. I understand that urea-type resins, alkyd-type resins and phenolic-type resins are all very scarce; especially is this true of the phenolic type because at present it is impossible to obtain phenol. But in case we cannot secure these types of varnishes we have the natural-type resin varnishes to fall back on. Of course,

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if we do change to this type of varnish, which is slower drying, we will probably need additional drying oven facilities.

In the lacquer and lacquer sealer field there is at present enough available for our present needs, but I am sure that the supply is dwindling and from the information available, there will be a serious shortage within the next 60 or 90 days. This is due to the shortage of nitrocellulose, solvents and other raw materials, used in the manufacture of these products.

Substitute Lacquer Sealer

A substitute lacquer sealer has recently appeared on the market to replace lacquer sealer. This sealer has the same amount of solids as most lacquer sealers on the market today. It can be sanded in 30 minutes to one hour (depending upon whether it is air dried or force dried) after it is sprayed. It can be coated over with either varnish or lacquer and it gives good results.

Then we have the varnish-type sealers. While they require force-drying (45 minutes to one hour at 135°F.) or overnight drying, they contain more solids and are tougher than most lacquer sealers on the market today.

There is an alcohol waterproof flat and gloss varnish on the market that many users of protective coatings are using instead of lacquer. This varnish is as clear as ordinary polishing varnish. The flat varnish of this type is being used on some of the 18th Century type of mahogany furniture, due to its clarity.

Shortage of Pigments and Alcohol

There is a shortage of pigmented materials both because of the shortage of the pigments and the materials used in the treatment of the pigments. Perhaps one way to deal with this will be to eliminate as many of our pigment colors as possible and get along with fewer colors. Sometimes we buy new colors when, by mixing certain colors we have on hand, we could produce the color we desire, thus eliminating the necessity of the finishing material manufacturer adding another color to his line.

While there is enough non-grain-raising stain available at the present to supply the demand, there certainly will be a shortage of this stain because of the shortage of methanol, which is used in practically all of these stains.* We have the old reliable water stain to fall back on if we can't secure the non-grain-raising stains, and while these require more drying time, they can be used even on conveyor systems if drying ovens are installed. Even in using water stain powders we may have to go to a more simplification of colors and perhaps work out and mix more of our colors ourselves instead of having the manufacturer match our color and thus cause him to add another color to his long line.

Alcohol Almost Unobtainable

Alcohol is almost unobtainable at the present due to its being on government priority and due to its use in the manufacture of gun powder—and while alcohol is used in different protective coatings, substitutes are being used.

Some foreman finishers are eliminating alcohol in wash coatings and stain washcoats by chemically treating their shellac and emulsifying it so that it can be used with

*Zapon advises that their Zaponol stain, which uses water-soluble stain powders in combination with Zaponol base, requires no alcohol or other strategic solvent . . . and requires no wash coat.

MAYBE the war has created some special finishing problems for you. Probably you have to use new processes, other raw materials, and different finishes.

But there are still plenty of alternate materials to be had. Ample research facilities are available to you. Other excellent finishes for your needs can be formulated.

Maas and Waldstein Company is helping many users of industrial finishes to adjust their processes to the present emergency . . . to find finishes that will meet their needs.

You, too, are invited to make use of our extensive research facilities and our years of experience in solving finishing problems.

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water instead of alcohol. (I am doing this at the present and am getting very good results.)

Of course, whether or not we are able to obtain many of our protective coatings depends upon the manufacturers of these materials being able to obtain many of the raw materials such as tung oil, oiticica and perilla oil, castor beans, etc., from abroad—and, of course, transportation of these is uncertain because of present and probable conditions.

I am sure that by using the present materials which we can get, and by using new and substitute materials available, that we will be able to keep both our defense business and civilian business going at full blast.

And in some cases of non-defense or civilian protective coatings, if we cannot get what we want we must and will accept what is available for us, for defense must come first always.

Editor's Note: The following comments on the foregoing article are from Rollin H. Wampler, who is with a finish manufacturer.

This intelligently-written article is certainly encouraging to those of us in the finishing materials industry, in that it shows that finishers are alert to existing and impending shortages.

To the factors mentioned as causing the finishing materials shortages I might add toluol, which is essential for the production of TNT, a military explosive.

Not only are urea and penolic-type resins scarce, but phthalic and maleic types are in an equally bad situation. Almost all of the synthetics are scarce. Even ester gum, the first to appear in the field, may become scarce because of military uses of products requiring glycerine. It might be added that ester gum seems to be fairly plentiful for the time being.

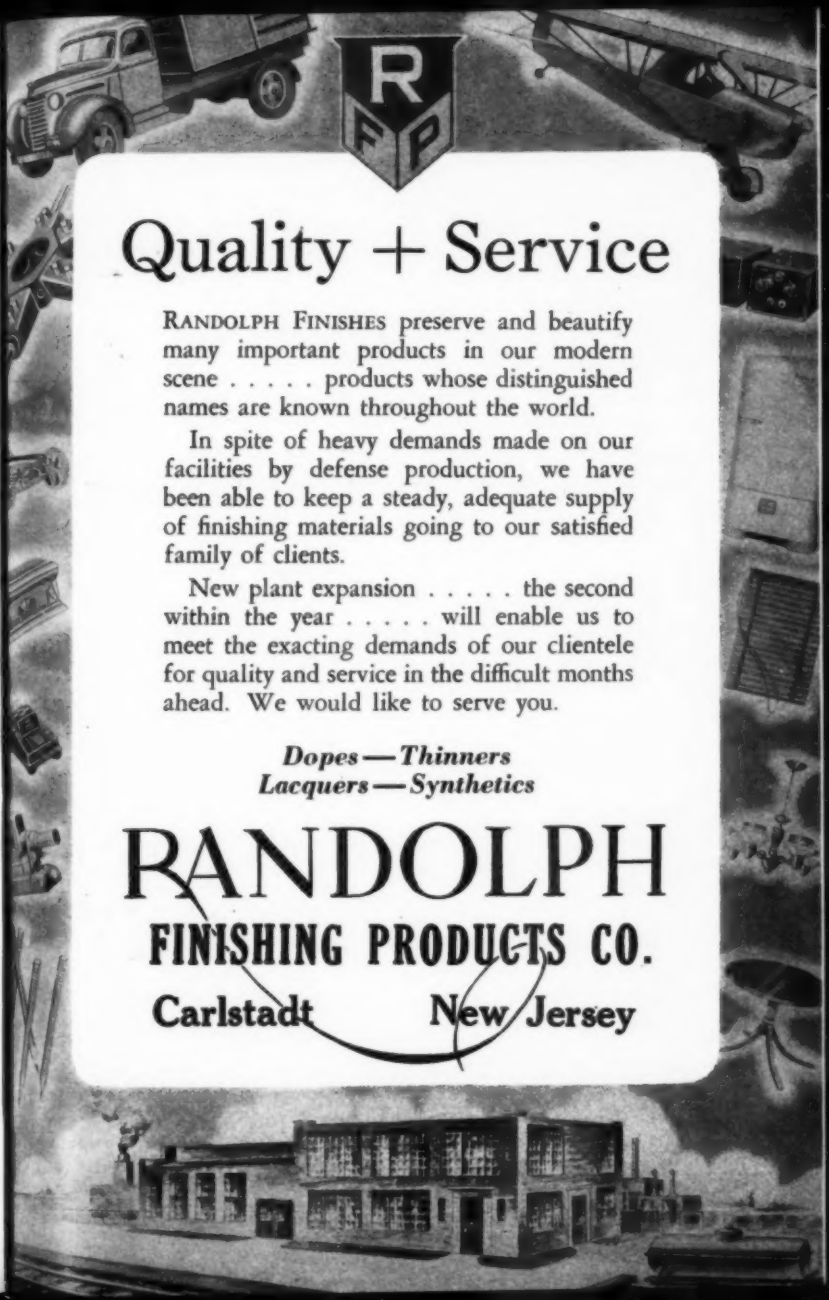
While I do not know just what product the author is referring to where he mentions a substiute lacquer sealer, I do know that many possible materials proposed as substitutes contain synthetics or solvents that are becoming scarce—or natural resins that come from abroad, especially from the eastern war theater. The same thing may be said about the alcohol-type waterproof flat and gloss varnishes. But there are large stocks of many such materials in the country. These stocks will last some time. What is urgently needed is a good substitute made entirely from domestic materials that are relatively plentiful—or at least plentiful in the foreseeable future.

As long as shellac, which comes from India, is available, water dispersions of this material will certainly save lots of alcohol.

Several good drying oils from domestic sources are available, and so it seems that there should be no acute shortages in this field soon.

The great variety of raw materials that may be utilized by the protective coatings industry will cetrainly enable us to make some kind of coatings for non-defense as well as defense uses. Users of our products can take comfort in this fact. Also, our industry is alert, and the tempo of research and development work is at a very high pitch.

While there are shortages in a great many raw materials for the protective coatings industry, there are still a large number of finishing materials available for civilian use.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New plant expansion . . . . . the second within the year . . . . . will enable us to meet the exacting demands of our clientele for quality and service in the difficult months ahead. We would like to serve you.
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Fig. 1—Striping tool used to lay a stripe on tubular shapes.

NATIONAL DEFENSE *Striping*

BY F. A. TITTEMORE
Beugler Manufacturing Company

THE USE of the mechanical striping tool is becoming more and more in demand as the defense program speeds up. In the aircraft industry, in ship building and in defense factories of all kinds, quick methods for marking for identification of parts are essential. In most cases the identification marks must withstand considerable abuse and long service. Due to the time element in our speed-up program, a fast-drying material must be used—one that has good adhesion and hiding power. This calls, in many cases, for a striping lacquer or similar material.

The striping tool should be as nearly trouble-free as possible—one that can be used in any position without dripping; one that is constructed so as to permit quick changes of the wheel heads and guides, and quick easy cleaning.

The accompanying illustration, marked Fig. 1, shows a striping tool with a single wheel head and double guides, which are necessary to lay a straight stripe lengthwise on tubing, bar stock or cable. The guides can be easily moved out of position or adjusted to permit striping around a cylinder, either with single or multiple stripes.

With the use of single, double or triple wheel heads (see Figs. 2 and 3) it is possible to produce a variety of stripe widths, together with an assortment of contrasting colors, therefore an unlimited number of distinct identification markings can be made.

The speed and accuracy of the stock-material keeper will be greatly increased if replacement parts and the different alloyed bar stock and tubing are properly marked for identification. It is advisable to have all bar stock striped

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P. S. For *Non-Defense* work Hilo Black Japans and Enamels are probably your best bet for CONTINUAL AVAILABILITY (in these days of raw material shortages) because of their formulation. Write for Bulletin No. 1.

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the full length rather than being marked just at the ends; this will identify the bar until it is entirely consumed. Other supply parts can be marked according to their shape, or the available space on them.

With thousands of replacement parts necessary for the various models or types of airplanes, the use of the mechanical striper and suitable colors is indispensible for permanent and positive identification. It is advisable, as in stock room practice, to run stripes lengthwise on all pipes, tubing and casings so that they can be identified after installation.

The Striping Tool's Use in Camouflage Painting

To the average layman, camouflage is merely a jumble of colors in irregular pattern, but to the camouflage artist the choice of color and the layout of the pattern are highly important. This artist's time is valuable and should be confined chiefly to layout work and a wise choice of colors. The filling in of the pattern can be done by the spray man or brush painter.

The layout or pattern work can best be done by the artist who has at his disposal several striping tools, each loaded with the color to be used in that particular block. For example, a green outline would indicate to the painter just which color is to be used to fill in that block. In this work it is advisable to use about a ¼-in. stripe. This is wide enough to distinguish the color easily and not large enough to use too much paint and cause unnecessary refilling of the striping fountain.

The paint material used for filling in the pattern should be nonreflecting or flat paint, with good adhesion and hiding power, as in most cases the time element will not permit a second application.

Automatic Striping

Due to the irregular shape of the numerous products and parts to be striped or marked, there is no standard automatic machine available that will accommodate all items. It is quite simple however to mount the striping tools on the frame work of a conveyor in such a way that the striping tool will lay on stripes as the articles pass.

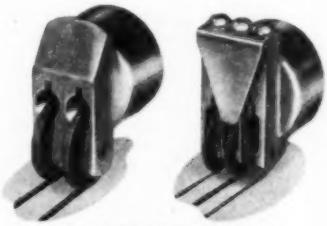

Fig. 2—Double-wheel head.
Fig. 3—Triple-wheel head.

Stripes can be put on automatically around the circumference of tubular and cylindrical articles, if or when such articles are arranged to be rotated.

In mounting the striping tools for automatic striping it is well to provide a slight spring tension to hold the wheel against the surface being striped, in order to take care of any variations or eccentric action. Stripers can be mounted in gangs for multiple striping if necessary—that is if the stripes are not too close together. Where stripes are close together and are not too wide, multiple-wheel heads are available, as illustrated in this article. Really the possibilities of a dependable striping tool are almost unlimited for both utility and decorative products painting.

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When our industrial tapes protect exposed furniture edges or surfaces during handling and shipping, your furniture is effectively guarded against bruises, scratches and chips. These tapes stick at a touch, need no moistening, fit on snugly, and come off cleanly.

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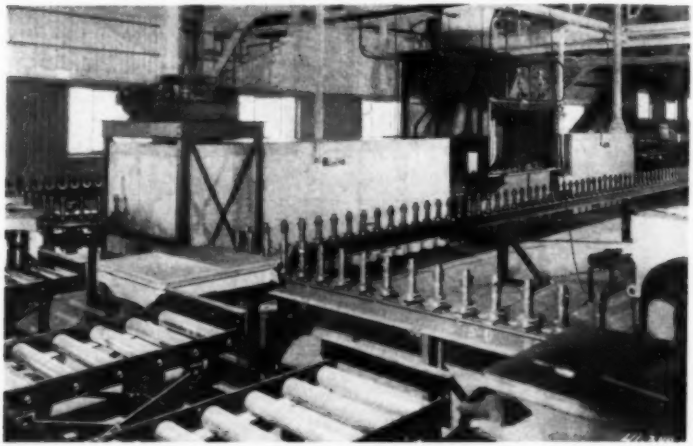

Overall view of a complete shell-painting line, with pre-heating oven, spray station, dynaprecipiter water-wash spray booth, baking oven, and loading and unloading stations. Shells are coated automatically. Photograph, courtesy of Binks Manufacturing Company.

Automatic Equipment for Coating Shells

MODERN automatic spray-painting equipment is coating ing the outsides of shells in sizes ranging from 20-mm. to 105-mm. at the rate of 1,000 an hour in several large shell-loading plants of the United States Government Ordnance Department.

The finishing is entirely automatic with the exception of loading and unloading the spindles. Shell parts to be finished are placed manually on spindles which are mounted on a long conveyor chain. Simple masking rings and plugs are used to protect threads from becoming coated in the finishing process.

The spindles with their loads first pass through a preheating oven which conditions the shells for finishing by removing all traces of moisture. From this oven the spindles carry the shells directly into a water-wash spray booth. Here the spindles begin to revolve rapidly and, as each one comes in front of the automatic spray guns, the shell on it receives a fine, even coating.

To avoid waste, the guns operate only when a loaded spindle is in front of them. The freshly coated shell is next carried into a drying oven, from which it emerges four minutes later completely dried and ready for immediate handling. In this way a shell is completely coated and dried every 3.6 seconds.

The coating material is supplied to the two or more automatic spray guns through a paint-circulating system. Paint regulators, oil-and-water extractors and a hose cleaner are conveniently mounted on booth.

In addition to the above-mentioned equipment, automatic and semi-automatic machines have been

(Continued on page 76)

Profits through Priorities

SEARCH FOR SUBSTITUTE FINISHES UNCOVERS IMPORTANT IMPROVEMENTS

BY I. R. MESSER

SHORTAGES in the field of industrial finishes may be blessings in disguise . . *Let me explain*: Many manufacturers have (for one reason or another) been using coatings that are neither completely efficient nor basically economical for *either* their product *or* their process.

Be Prepared to Meet a Shortage

In such cases, the forced, scientific search for a substitute will undoubtedly disclose opportunities for permanent improvements . . This is happening every day.

Prescription Finishes, Best Answer

If you have never had a good *prescription* paint laboratory analyze your coating problem, you may be in for a pleasant surprise. Specialists in this kind of work will "tailor make" a paint formula to fit your needs *exactly* . . and where a certain ingredient is no longer available they'll often find a substitute that out-performs the long accepted original.

It May Happen to You

The important point is to be *prepared*. Don't wait until a priority ruling pins you down. Submit details of your finishing requirements, at once, to a *true prescription* house like The Watson-Standard Company at Pittsburgh. This concern *guarantees* a manufacturer *answers* based on his individual conditions and not just the application of a standardized formula. Perhaps they'll find a way, at once, to give you better coatings at lower costs, but in any event, they can guide you through the difficult times ahead and you certainly are not putting yourself under any obligation.

Procrastination Is Dangerous

The Watson - Standard Company for years has specialized in prescription finishes for all surfaces by spray, dip, brush or roller application. Their field comprises every type of industry under every condition. Their record is impressive. To them, *the problem, not the prospect*, is the important *thing*. Write to them direct — today — with the assurance that your letter will receive the personal, confidential and sincere attention of some of the most highly skilled paint chemists in the country.—Advertisement.

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An over-all view of the three separate shell-painting lines in Building 322 at the Kingsbury Ordnance Plant, near LaPorte, Ind. Notice the air-blast cleaning tables in the foreground, control switches, and loading space. Photograph, courtesy of Binks Mfg. Co.

developed for spraying the inside and outside of shells ranging from the small 20-mm. size up to 2,000-lb. bombs. These machines vary greatly in the required production rate according to the needs of each manufacturer.—BINKS MFG. CO.

Preventing Rust on Iron and Steel

MACHINERY, tools, steel and iron products of all types, which are not finished and have to be stored away for an indefinite period of time, have a tendency to rust or become rust pitted.

Two methods are employed in combating rust and to prevent it from consuming steel and iron. First, there is Bonderizing or Parkerizing, which consists of a chemical treatment that deposits a phosphate coating on the surfaces. However, this is only a temporary protection; it requires a subsequent coating of the surface with some suitable type of material.

Then there is the use of a waterproof coating of a spar type—or even, in some cases, a slush oil is used for temporary protection.

Now there is a new coating being marketed by the name of "Stop Rust Coating," which combines both principles mentioned above. It contains a rust-inhibitive chemical ingredient and at the same time is totally waterproof, rendering double protection against rust. This type of coating dries quickly and leaves on the surface a transparent film which is hard and non-tacky—and the article submitted to this treatment can be shipped and handled for an indefinite length of time. When the surface has to be enameled later on, the rustproof coating can be easily removed by means of a solvent. This coating is really an enemy of rust; it is one of the most modern preservatives vital to our present program of saving steel and iron for defense.—JOSEPH TOKARZ.

To replace plated-metal effects we have already developed transparent baking colored coatings that produce a brilliant metallic effect. Other colors are still in the state of development. The baking time and temperature can be varied for individual needs.....178

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Finishers' Fire Safety

Department Protection Emphasized As Nation Speeds Defense Program

BY LEONARD F. MAAR
Safety Research Institute

UNDER the impetus of the national defense program, production is being speeded up in many lines of industry. Records of past years show that in times of greater industrial activity the number of fires increases proportionately. In finishing rooms, therefore, where the fire menace is particularly serious, greater care than ever must be taken to safeguard work in process and the equipment involved in finishing processes.

There have been many discussions of fire safety in its relation to this department of industry and considerable authoritative and technical literature is available on the subject. But at times like the present a review or a check-up of actual plant conditions may reveal the need for tightening up the defenses against fire. When men are engaged day after day in hazardous processes they have a tendency to minimize the dangers because of their familiarity with them. For this reason careful supervision is an important factor in fire safety in the finishing processes.

Sportsmen have a phrase that well defines the desirable mental attitude. Of an athlete who is unrelentingly in the play, they say he is "on the ball." In the finishing room, management must be "on the ball," if fires are to be averted or extinguished with a minimum of loss.

Causes of Finishing Room Fires

The causes of fires in finishing departments are well known. In connection with spray booths or spraying operations, fire is most commonly traced to these causes:

1) Electrical defects in motors, fans, broken lamps, etc.

2) Accumulations of deposits in booths and vent pipes.

3) Poorly designed and guarded vent pipes.

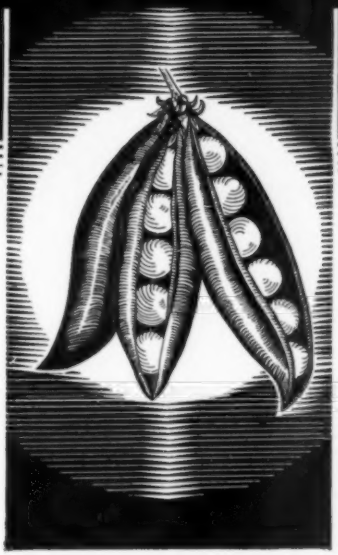
4) Static electricity.

As for as dip tanks are concerned, the principal hazard is in the use of highly flammable liquids that are subject to flashing at ordinary temperatures and that give off flammable or explosive vapors.

Other Hazards

Metal - cleaning processes, flow-coat work, the new infra-red lamp dryers and ovens—all of these present special hazards that are, or should be, thoroughly understood.

Routine measures for preventing fires from these sources probably are in force in all plants where any volume of work is involved. The



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great danger lies in the fact that the stringency of these measures may be relaxed under the pressure of increased production. The cure for this is more intensive safety training for employes, the organization of departmental fire brigades, and closer supervision of work. All these things can avert the majority of fires and keep losses low in those fires that do occur.

Departmental Fire Brigade For Real Defense

Many industries are turning to the departmental organization of the plant fire brigade. In each department, under the leadership of the foreman, full-time and physically capable employes are trained to recognize fire hazards, to know how to prevent fires, and to serve as members of the departmental squad. As their responsibility in these matters grows, trained employes become the best defense, not only against fire but also against sabotage.

The departmental fire brigade is organized into units, with details of men assigned to special duties. On the first line of defense is the fire extinguisher detail. It is the duty of its members to operate fixed manual systems or supervise the operation of automatic fixed systems. They are also armed with portable extinguishers in adequate number and of suitable types for the classes of fires they may encounter in their department.

Backing up the fire extinguisher detail is a squad assigned to laying standpipe hose, connecting hose to yard hydrants, etc. Another group is assigned to salvage work, closing tank covers, covering machinery with tarpaulins, etc. All employes should know how to turn in fire alarms according to the plant system. This system provides protection in an instant at the point where it is needed, obviating delays that may result from bringing men from distant departments to the scene of the emergency.

It Worked in Chrysler Plants

In 16 plants of the great Chrysler Corporation, three years after this system was adopted, the number of fires had been greatly reduced and losses were cut 60%. It is in the loss statement that the departmental brigade will make the most satisfactory showing, for, in the majority of cases, the fire extinguisher brigade will stop a fire before it spreads beyond the point of origin.

In finishing room fires extinguishers approved and labelled by the Underwriters Laboratories or the Factory Mutual Laboratories under Classification B are standard equipment, because they are approved for use on flammable liquid fires. These are the foam, vaporizing liquid, loaded stream, carbon dioxide, and dry compound types.

Baking the Finish on Army "Jeeps"

REFERRING to the illustration on page 82, we are informed that Willys-Overland, Toledo, Ohio, installed the near infra-red process to bake protective coatings on "Jeeps", as well as on standard passenger cars. Previously the company had used a 185-ft. steam convection heating zone. The frame work and the 1990 near infra-red reflectors were installed within the housing of this oven.

The "Jeeps" get a prime and finish coat of standard Army specification olive-drab lusterless enamel. After the first spray coat, which

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Stillwell 4-4413-4-5

is put on heavy, approximating a dip, the chassis enter the tunnel which is lamped for 375 watts for a distance of 12-ft. The remaining portion of the tunnel to the second spray operation uses 125-watt lamps.

After the second spray coat, they continue through the portion of the tunnel that is lamped for 250 watts for a distance of 12-ft., the remainder of the tunnel using 125-watt lamps.

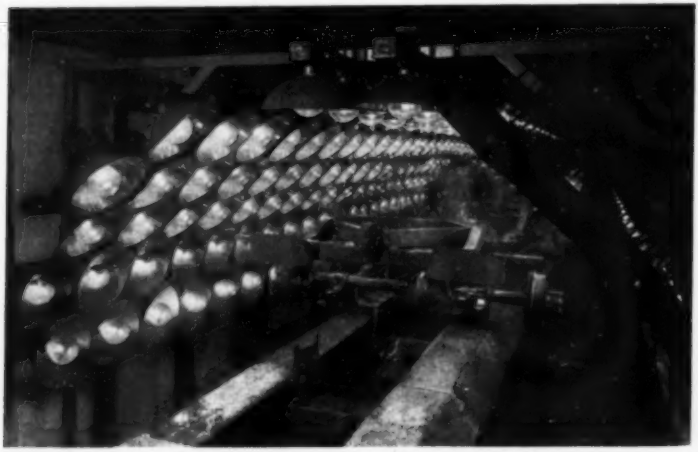
This job was engineered to properly process the finish with the conveyor moving at a speed of 6½-ft. per minute, drying the prime coat in 12 minutes and the finish coat in 10 minutes.

At the present time, the speed has been stepped up to approximately 10-ft. per minute, baking the finish in shorter time and producing about 22 cars per hour. Willys officials say they expect to step up production to 35 per hour.

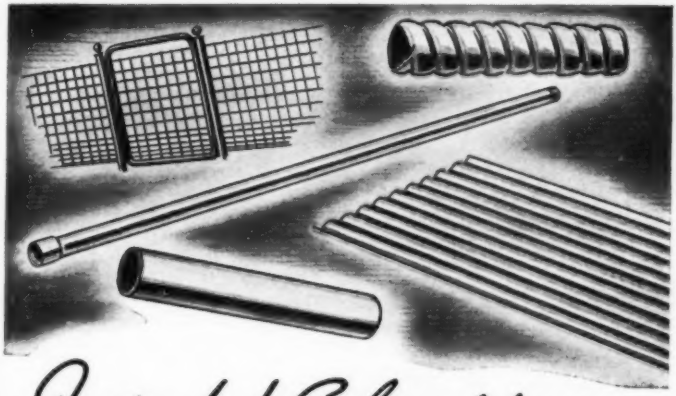
It will be possible to step up this production to a still higher point without radically changing equipment, since wiring has been installed so that each reflector will accommodate 375-watt lamps when and if necessary. This foresight in wiring will save much time and expense later.

The tunnel needs no preheating period prior to operation. When the switches are turned on and the material is sprayed, it immediately proceeds with the same beneficial baking results that would result if the tunnel had been in previous operation. This means that at lunch periods the switches are thrown to save current and are ready for immediate use when turned on again.

The kw. load of this job made it necessary to install a special transformer and substation, furnishing 25-cycle current. Service is 440-V, 3-phase, with the load completely balanced. Total load is 303 kw.



Chassis for Army jeeps are spray-painted and moved by conveyor through the tunnels of near infra-red lights to bake the finish which will be subjected to very hard service. This photograph and article were supplied by courtesy of the Fostoria Pressed Steel Corp.



Instead of Galvanizing—

"GLIDDENIZE"!

● "Gliddenize" is a sensational coating that replaces galvanizing on all metal products. A brand new Glidden development that completely satisfies every exterior protective requirement for which zinc has hitherto been employed.

—a paint product that actually shows protection and endurance equivalent to galvanizing by salt-spray tests.

—applied by spray, dip, roller or brush. Air dries to handle in 15 minutes, or bakes at schedules as high as 350°.

—already in practical use by leading manufacturers for fencing, electric conduits, piping, tubing, sheeting and allied products.

If galvanizing is a "critical" on your finishing list, send for the Glidden representative. Let him tell you more about "Gliddenize."

THE GLIDDEN COMPANY • National Headquarters, Cleveland, Ohio

Factories or Branches in Principal Cities

TIME-TESTED
GLIDDEN PRODUCTS CARRY THIS FAMOUS MARK OF QUALITY

GLIDDEN
Everywhere in Everything

Individual switches were installed on each 8-ft. section, and both the prime and final portions of the tunnel are equipped with separate heavy-duty, oil, circuit-breaker switches.—F. P. S.

Finishing Materials —1942

(Continued from page 17)

tutions, possible imports by roundabout routes, etc., together with the needs of the armed forces, have to be evaluated before industry will learn what it will get. However, it seems to the writer that it is better to be prepared for the worst and endeavor to take the best steps possible to weather the storm.

Thin Films of Finish; Eliminate all Waste

Assuming that there will be some allocation of these various items to non-defense use, it would seem obvious that close finishes of minimum thickness for protection and salability will be advisable. It is suggested that multi-coat high-grade finishes be kept in reserve for peace-time competition. If all concerned will cheerfully agree to this, there should be no difficulty. More finished merchandise will then be available for the public from a given limited amount of finishing material.

Waste of any type should be strictly guarded against, whether through carelessness in use or through negligence that results in spillage or fire. Containers, such as drums, should be handled more carefully; they are in great demand and difficult to replace, so every effort to keep them in good shape is worth while.

We know everyone realizes that present conditions are changing rapidly and what may be true today will not be true tomorrow. Nevertheless, we feel that the readers of your magazine are interested in these developments, even though some of them may no longer be available.—T. S-W. Co.

Real Problem Now Is Achievement of Victory

It is to be hoped that these forebodings will be proved baseless and that everybody will have all he needs of everything throughout 1942. It is difficult to see how this can be done with the vastly increased scope of our defense—and now offense—program and it will be wise for all concerned to keep in close touch with conditions and not make commitments too freely or too far ahead.

The one real problem for 1942 is Victory. The price of Victory is not only casualties in the battle areas but almost certain difficulties and losses in the industrial field. Let us do our best to maintain the best possible relationship toward national needs, our customers and our suppliers.

Rubber Putty Catalog

Of particular interest now, since so many defense emergency jobs require specialized materials that meet rigorous service requirements, The B. F. Goodrich Co., Akron, Ohio, has just published a new catalog section on its Plastikon rubber putty. Copies are available upon request to the manufacturer.

The section describes the properties of the product, non-hardening, corrosion resistant, waterproof, air-tight, no mixing required, quick-drying and excellent adhesion, lists the grades, gives directions for use and a large list of applications in which it has proved successful.

These latter include glazing, use in chemical plants, plumbing, air-conditioning of buildings or rooms, marine service, general construction and automotive.

For want of a Nail
A shoe was lost
For want of a Shoe
The horse was lost
For want of a Horse
The rider was lost
For want of a Rider
The battle was lost
For want of a Battle
The Kingdom was lost
All for the want
Of a Horseshoe Nail
— B. FRANKLIN

For the want of a proper finish a product, too, can be lost.

This is especially true of defense items which must be produced on a rigid schedule and with which no manufacturer can afford to experiment at this time.

Egyptian Finishes, known to and used by industry for a half century, are becoming increasingly important in the finishing of hundreds of defense products.

We will welcome an opportunity to discuss your requirements with you, and we cordially invite your inquiry.

THE EGYPTIAN LACQUER MANUFACTURING CO.
ROCKEFELLER CENTER NEW YORK

EGYPTIAN FINISHES

EGYPTIAN Superior FINISHES

Improved Respirator

Featured improvement of the improved M. S. A. Single-Filter Dustfoe respirator is the new single filter which replaces the 2-part (felt screen and cellulose) filters used previously. This new filter is all in one piece, giving U. S. Bureau of Mines approved protection against an even broader range of dusts and mists, according to the manufacturer. The filter is more pourous on the outer side so that the larger dust particles are filtered out first, thus preventing rapid build-up of breathing resistance through clogging of filter.

The compact, lightweight unit offers low breathing resistance and full vision in every direction. A protective filter cover prevents contamination of filter by grease and dirt from hands and equipment. A foolproof exhalation valve—leakproof army gas-mask type—provides drainage. The formable facepiece of the Dustfoe may be shaped to fit individual face contours. It can be completely disassembled without tools in a few seconds; every part is interchangeable and, except for the filters, can be washed and sterilized. The inexpensive single throwaway filters permit a fresh new filter with each cleaning.

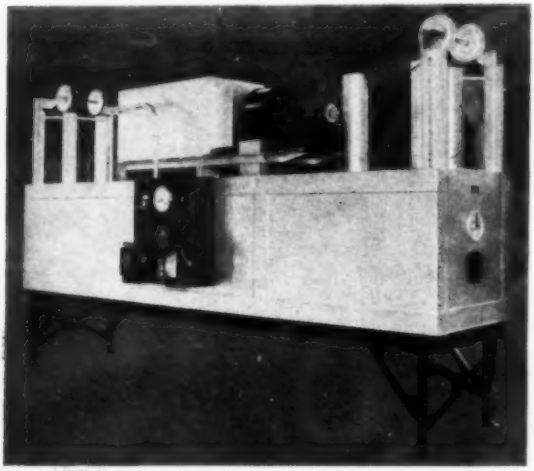
This new respirator is a product of Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh, Penna.

New . . .

MATERIALS
SUPPLIES
EQUIPMENT

Dehydrating Oven for Defense

The accompanying illustrations show two views of an oven used by a large airplane manufacturing concern that builds military planes exclusively. The oven is used for dehydrating aluminum tubing used in the airplane structure. It is a product of George Koch Sons, Inc., Evansville, Ind.



The complete oven as it appeared set up ready for service in the aircraft factory.

Protective Coatings

FOR THE EMERGENCY

AS A DEPENDABLE source of supply for all types of protective coatings, and to speed up defense production finishing requirements, Walker is in position to provide primers, surfacers, lacquers, synthetics and wrinkles. Every ship, tank, plane and gun must be coated . . . . and Walker can help you with your problems in meeting government specifications. There are also available, to a limited extent, materials and service for non-defense activities.

"Call on Walker"

H. V. WALKER CO.

Elizabeth, New Jersey

MODERN PRODUCTION FINISHES

The unit is electrically heated, with complete automatic controls for maintaining any temperature from room up to 200° F. in the oven when loaded with a bundle of aluminum tubing. Equal temperatures are maintained throughout the unit, as it is very important that the tubing does not become heated to more than 200° F. during this process.

End view of the oven, with its counter-weighted doors.

The vertical lift doors are counterweighted with enclosed counterweights to give finger-tip control and at the same time provide a tight seal against heat loss when the doors are closed.

This oven is substantially mounted on structural steel framework and it has rollers to facilitate the entering and leaving of material being treated. Also, it is fitted with indicating temperature gauges.

Skin Protection

Texkin keeps industry's hands soft, smooth, sensitive and free of industrial dermatitis. At the same time it saves the waste of solvents so often used to remove the stains of lacquer, paint, varnish, grease, grime, inks, tar, and even dry colors.

Texkin is a soft cream, which, when rubbed over skin of hands, arms, face and neck, dries to a thin, impervious, flexible film. Although it is so thin that it cannot be felt, or impair sensitivity of touch, this film keeps all stains from the skin. And it is removed with its accumulated load of stain, by simply washing with warm water. Leaves hands soft, smooth, clean. Supplied in trial jars, quarts and gallon cans. Made by Doster and Co., 4833 Rice St., Chicago, Ill.

Cleans and Treats Metal Parts

The 2-strand, cross-rod conveyorized Detrex Processing Machine shown in the photo herewith has been specially designed and built by Detroit Rex Products Co., 13005 Hillview Ave., Detroit, Mich., for the cleaning and treatment of metal parts. It follows an approved U. S. Army and British procedure for the treatment of aluminum alloy sheets used in aircraft to make them less pervious to the effects of air, and to provide a better paint bond. This machine incorporates hot alkali wash, hot water rinse, hot chromic acid dip, hot water rinse, and oven dry-off.

The machine is a compact self-contained unit. Further floor saving is obtained by the oven being located over the top of the dip tanks, with the return flight of the conveyor passing overhead through the oven back to the loading-unloading station. Another important feature of this simplified and condensed set-up is that both steam and acid fumes are positively withdrawn from the plant so that operating conditions are greatly improved. This unit makes savings by eliminating rehandling the work.

PROTECTIVE FINISHES FOR DEFENSE!

We look forward, now, as earnestly as ever, to serving you and serving our nation. We are deeply appreciative of your past patronage and your friendship during the present national emergency. Please call on us for any counsel or help, without any obligation on your part.

The CLINTON Co.

Manufacturers of Quality Industrial Finishes

1210 ELSTON AVENUE **CHICAGO**

"Always AT YOUR SERVICE"

It is fabricated from steel plate, reinforced with structural steel, and is of all-welded construction supported on structural steel sill. The oven paneling is insulated with fibre glass.

The hot alkali tank, hot water rinse tanks, and chromic acid tank are heated by multi-pass steam coils, tested for a working pressure of 200-lbs. per sq.in. Each tank is equipped with a gauge glass, drain valve, direct-reading dial thermometer, and quick-opening clean-out door. The alkali and chromic acid tanks are equipped with charging hoppers. Each tank is provided with an overflowing scum trough. Large inspection doors are provided over the tanks and large access doors are located at the rear end of the unit (one over the final hot water rinse tank and one in the oven). The hot chromic acid tank is supplied with a direct-acting, self-operated temperature regulator. Duct work and blower are arranged to exhaust from each end of the washer, and from the chromic acid stage. The dry-off oven is heated by a blast heater arranged for high pressure steam.

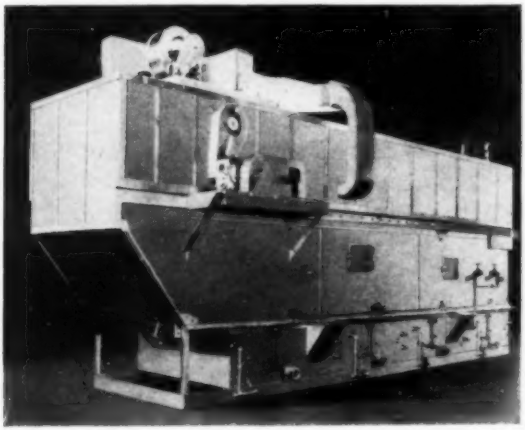
The conveyor drive is complete with roller chain drive, shear-pin-hub sprocket, double wormgear reducer, variable-speed motor pulley and base.

These processing machines are built in various sizes to accommodate individual production requirements. The unit shown, for example, has the following approximate overall dimensions: Length, 29-ft. 10-in.; Width, 13-ft. 9-in.; Height, 14-ft. The work clearances through the machine will accommodate baskets 48-in. long by 18-in. wide by 12-in. deep (18-in hanging from the center line of the crossrod to the bottom of the basket.) The approximate weight is 17,400-lbs.

Safe Skin Cleansers

On the above subject, we quote the following excerpts from a letter by G. H. Packwood Mfg. Co., 2040 Walnut St., St. Louis, Mo.:

The Pax line of industrial skin cleansers are unique in that they offer a safety factor not realized in any other granulated industrial skin cleanser. We have a controlled alkaline content that is responsible for this safety factor. For your information, a hand soap with high alkaline or abrasive content is not safe for continued usage because the alkali or abrasive in the soap so abuses the skin that it causes it to crack, chap



Detrex processing machine for aluminum sheets and parts; it has alkali wash, water rinse, chromic-acid dip, and overhead drying oven.

FOR NATIONAL ~~DEFENSE~~ OFFENSE!

FORBES IS PREPARED to supply you with technical protective coatings that you need for finishing war munitions and equipment.

You will be interested in our series of Technical Bulletins which give detailed information on specification finishes. Send for the complete folder.

THE FORBES VARNISH COMPANY

3800 WEST 143RD STREET CLEVELAND, OHIO

ESTABLISHED 1908

FINISHES FOR THE PRODUCTS OF INDUSTRY

and dry out. This is the first step towards skin irritations and industrial dermatitis—a condition that is gradually disappearing in many industrial plants because of our vigorous safety soap campaign.

We are sending you some recent literature published by Pax on the matter of safety. We have had a number of requests for our pH booklet, which is a very interesting and informative booklet on the highly technical subject, "pH." Copies will be sent to those interested.

Applies Draw Lubricant To Steel Sheets

An important speed-up in applying draw lubricant to steel sheets preparatory to shaping or forming, is one of several results reported for a new coating machine developed by the Chas. E. Francis Co., Rushville, Ind.

The machine consists of two corrugated rubber coating rolls for coating the sheets on both sides. A doctor or scraper roll is used in conjunction with each coating roll, not only to govern the thickness of spread but also to form a roll crotch to hold the compound. If so desired, the lower coating roll can be adapted to pick up its supply of mixture from a stationary or adjustable pan. Calibrated adjustments are used for governing the spread, as well as for adjusting the opening between the rolls for thickness of metal.

A large manufacturer recently installed one of the machines alongside a 75-ton press which shapes steel sheets into radio cases, heater shells, etc. Metal sheets are fed through the coater and a very heavy draw compound is applied in a thin, accurately governed spread to both sides — the purpose of the draw compound being to act as small ball bearings when in press to permit movement of metal when a deep draw forming is being accomplished.

The coating machine makes possible an estimated savings of about one-third in draw compound over the hand brushing method, and produces considerably more work in shorter time. Its drive is usually provided by a direct connected geared-head motor.

If desired, the machine is furnished on a welded steel stand mounted on casters to permit moving to different positions. It can be had in any width —in regular or extra heavy construction, bench or floor models, and for single or double coating.

U. S. Specification Paints Explained

Many manufacturers have been hampered in figuring on Government contracts involving specification finishes, which are usually identified only by code numbers, because of lacking material costs, thinning and drying data, and other essential information. In answer to this need the Roxalin Flexible Lacquer Co., Elizabeth, N. J., announces publication of a convenient file folder entitled "Facts on U. S. Government Finishes." This folder contains data sheets on the widely used Army and Navy specification finishes and tells how and where they are applied.

With this information before him it is now possible for a manufacturer, not heretofore familiar with Army and Navy finishes, to figure his unit costs accurately and establish the most efficient production schedule in keeping with his particular equipment.

The file folder and an up-to-date set of "Facts on U. S. Government Finishes" may be obtained by writing to Roxalin Flexible Lacquer Co., Elizabeth, N. J., Box 511.

Spray Gun Needle-Nozzle Test

"How long will a Milburn needle and nozzle remain in operating condition"

This question has been asked by dozens of prospective spray gun customers, and in order to establish a satisfactory reply, the Engineering Department of the Alexander Milburn Co., Baltimore, Md., conducted a test.

A Type OM spray gun was equipped with a No. 53 stainless steel nozzle and needle, and then attached to an air motor. A counter was applied, and over a period of 32 days, the gun was operated 817,081 times. At the conclusion of the run, the needle and nozzle were found to be in perfect condition.

This company offers a chart showing the various head and nozzle assemblies for all types of materials sprayed by Milburn siphon and pressure-feed guns.

Durability . . .

Silence is not *always* golden. Lasting quality . . . the ability to withstand wear . . . is admirable. But consider the Sphinx. No one remembers the name of the builder.

Remember this fact when you select a finish for your product.

Creating the *right* finish requires the same inventive ability, the same engineering skill and the same productive capacity as the product itself. Durability is no longer enough. Problems of application, cost, appearance, specific characteristics to meet specific requirements, may be equally important.

We can help you create a finish to fit your product EXACTLY . . . a finish engineered to your SPECIFIC needs. Finish should be your best salesman. Don't use one that's *dumb!*

Your inquiry incurs no obligation. Address Department "A".

STANLEY

THE STANLEY CHEMICAL CO.

EAST BERLIN CONNECTICUT

Lacquers · Enamels · Synthetics · Japans

A SUBSIDIARY OF THE STANLEY WORKS, NEW BRITAIN, CONN

Coating Hairpins

We are manufacturing wire hairpins and have great difficuty in finding a satisfactory method of finishing them. A sample pin with the desired finish is being sent you with this letter.

The pins come off the machine through a chute, at the rate of 65 per minute, and we are at present running them through a pair of felt rollers dipped in varnish, then by conveyor to a gas stoving oven. The results are rather disappointing, giving a patchy finish, rather susceptible to rust.

Dipping has not proved to be satisfactory owing to the lacquer or varnish running into smears or blobs; and tumbling was found impracticable owing to the pins forming a solid mass in the tumbler.

It will be noticed that the required finish is very thin, very hard and practically rust-proof.

If you have any material suitable for this purpose (in black or bronze) we would be glad to learn prices and details, and further, we should be most grateful for any particulars of methods of application which you may be able to obtain for us.

In the event of your not having this information, would you be so good as to pass this inquiry on to any bureau or establishment which you consider would be able to assist us.—Eastern Platers, Victoria, Australia.

We are pleased to advise you that hairpins can be enameled with the proper material in our machine (Barrett Filwheel Enameler). At the present time, we have several enamelers doing this kind of work and are making two more for a concern in New York.

The pins are handled in bulk at the rate of 20 loads per hour. They are placed in the machine in a wire-mesh basket where they are submerged with the enamel. After the cover is applied, they are spun for about 25 seconds. When removed from the machine, they are dumped into wire trays for baking.

If the pins have been oxidized and are black in color, one coat is sufficient. Two coats are necessary to cover bright pins. All of the enamel that is thrown off in the machine is caught in a container and can be used over again. With our method of application, very few, if any, contact marks are left on the work. A tough durable finish is produced.

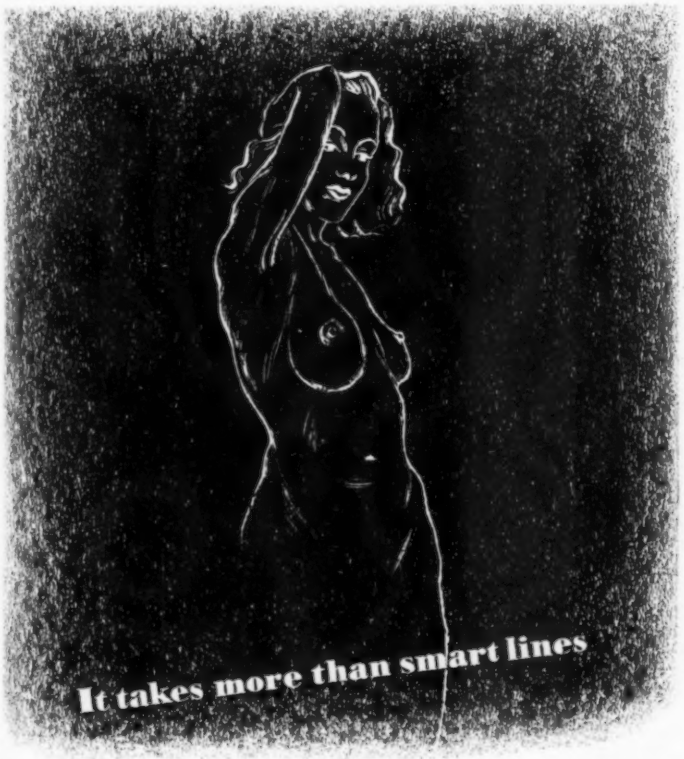
For this work, we have several sizes and types of machines.—THE LEON J. BARRETT CO.

Questions; Answers

Questions are welcome and will be answered promptly by mail. Readers are invited to prepare and send in additional information relating to any of these questions and answers.

A Stain that Doesn't Raise Grain

In the November INDUSTRIAL FINISHING (starting on page 21) there is an article by Mr. Rollin H. Wampler, in which he makes a statement that water stains will raise the grain of the wood, making it necessary to wash coat and sand the surface before filling.



Many a woman is possessed with smart lines . . . a sleek, graceful figure . . . yet she is not endowed with beauty. Careful grooming with the proper cosmetics . . . *finish*, if you please . . . must add the touches of comeliness which complete the splendor of beauty.

So, when your designers creat smart lines and graceful contours for your product, don't consider the job completed if you value eye-appeal. Finish must do its part . . . a part that will definitely contribute to greater sales.

Write us regarding our Creative Studio . . . let us tell you how we originate *protective* and *sales-stimulating* finishing schemes for reputable firms, without cost or obligation.

ROCKFORD VARNISH COMPANY

Manufacturers of Finishing Materials

ROCKFORD • ILLINOIS

NO TAMPERING WITH QUALITY

$12.50 PORCELKIT FREE WITH EACH MASTER FINISHER'S REPAIR KIT...

which contains 52 items (double the number of any other kit), includes $7.00 "N 2 ELECTRO-KNIFE" to use with our famous LACSTIX packed in new type heavy gauge steel chest, cantilever construction with leather handle. Also, includes well known LUBRISOL PAD-O-PAQUE PROCESS.

With each order for the MASTER FINISHER'S SUPREME SERVICE REPAIR KIT at only $34.50 you will receive free of charge a $12.50 PORCELKIT, shown at left corner of illustration. It contains 21 items, including our well known PORCELSTIX.

LACSTIX are burn in sticks which do not shrink or swell under lacquer.

PORCELSTIX are burn-in-sticks to repair porcelain.

LUBRISOL PAD-O-PAQUE PROCESS enables anyone to make finishing repairs in 10 minutes without instructions.

Limited offer; write today. Also, INSTRUCTION CATALOGUE CARD BOOK on Finishing FREE for the asking. Write for it today.

Here's a picture of the MASTER FINISHER'S SUPREME SERVICE REPAIR KIT and Contents

FINISHINE LABORATORIES, Inc., SYRACUSE, N. Y.

Our Zaponol stain, which uses water-soluble stain powders in combination with our Zaponol base, requires no alcohol or other strategic solvent. As you may observe by looking over the attached folder, this material requires no wash coat.

I believe this is one of the biggest things we have to offer, during the present emergency, as well as after it is over.—E. H. BUCY, Technical Director, Zapon Division, Atlas Powder Co.

EDITOR'S NOTE: According to the folder just mentioned, "The basis of Zaponol and the secret of its effectiveness is a new synthetic resin developed . . . and produced exclusively for this new stain . . . uses regular water-stain powders to produce the utmost in brilliance and light fastness of color. The coloring materials are dissolved in the water solution of the new resin . . . It sizes as it stains. This remarkable sealing effect, due to the resin base, allows 'controlled penetration' by which all surface fibers are uniformly stained, but excessive penetration of the material is prevented. Zaponol is non-soluble in subsequent finishing materials and is unaffected by them, giving added brilliance to the finish."

Metal Finish, 1400° F.

We are looking for a material with which we can coat steel racks which are to be repeatedly subjected to annealing temperatures. The object of this coating is to protect the steel from continued oxidation. The temperatures encountered are in the neighborhood of 1400° F. It would be desirable to have a material which could be ap-

plied like paint. Do you know of anyone who can furnish such a material?—T. A. Corp.

We believe that our Thur-Ma-Lox heat-resisting protective coatings will solve your problem. Thur-Ma-Lox protective coatings are made up in two grades: No. 7 Black, which will withstand temperatures up to and including 1800° F.; and No. 10 Aluminum which will stand temperatures up to and including 1400° F. Both materials are applied as regular paint. Their difference is in the pigment which in the case of Thur-Ma-Lox, is a ceramic material that fuses to the metal upon the application of heat.

As to how long Thur-Ma-Lox No. 7 or Thur-Ma-Lox No. 10 Aluminum would prevent oxidation, we cannot say. This would depend somewhat on the length of time the steel racks are subjected to a temperature of 1400° F., and upon the number of cycles in and out of the annealing furnace. Thur-Ma-Lox protective coatings were not principally designed for this type of application. They were designed for protecting heated metal surfaces such as unlined steel stacks, ducts, flues, blast furnaces, stoves, locomotive front ends, boiler fronts, super-heated equipment, etc. However, we do have several applications in which Thur-Ma-Lox is used on steel racks, although the temperatures are not quite as high as 1400° F.

We would be very happy, therefore, to forward to you a small sample can of either of these products so that you may try it out yourself.—The M. W. KELLOGG CO.

EDITORS NOTE: Quoting from the company's literature about Thur-Ma-Lox No. 7: *(Cont'd page 98)*

FOR INCREASED PROFITS in 1942

• If you haven't as yet gotten into Flocking, you ought to seriously consider it for 1942.

• The ease with which flocking is done, the utterly different appearance it gives, the many avenues it opens for more business and greater profits, can aid materially in your progress during the new year.

• Get some genuine

CLAREMONT FLOCKS

COTTON—WOOL—RAYON

and begin making some real profits.

•Color Card and Samples sent upon request.

CLAREMONT WASTE MFG. CO.

CLAREMONT, N. H.

The country's leading makers of Cotton, Wool and Rayon Flocks

It is a black heat-resistant coating for metal that gives continued protection over a range of temperature from ordinary conditions to 1800°F. This product is composed of a specially prepared organic vehicle and pigment, which are both exclusively manufactured under patented formulas.

The vehicle is a neutral pitch mixture which has been sufficiently thinned so that it may be applied by either spray or brush.

The heat-resisting pigment has very high adhesive and heat-resisting properties. It is inert toward the vehicle, which allows for the maximum protection that the vehicle may give. It also has the peculiar character of functioning as a secondary vehicle under heat, which prevents a loss of protection that is common to most paints when under temperatures in excess of 500°F.

This coating remains in an elastic condition throughout its life, expanding and contracting with the heating and cooling metal. This prevents cracking or peeling, and makes the coating impervious to moisture and actions of the elements.

When applied to a cold surface, the drying time is approximately 12 hours; on heated surfaces, the drying time is reduced to one hour.

Due to a number of characteristics, this coating has a high resistance to the weather. It is unaffected by the fumes of sulphur dioxide, carbon dioxide, acetic acid or chlorine, even in the presence of moisture. Alkalies such as sal soda, caustic lye, soda ash or ammonia have no effect on the protective power of the coating.

Due to the heavy pigment, shipments are made only in 1-gallon and 5-gallon containers.

To insure complete incorporation of pigment found in the bottom of all containers, pour off all liquid and mix pigment into a semi-paste; after this has been completed, gradually pour all liquid back into the container and thoroughly stir so that all pigment is in complete suspension. Frequent stirring while painting is recommended. Before a surface is painted, all scale, rust and loosely adhering paint should be completely removed with scrapers and wire brushes, or by sandblasting. Heavy scale can be removed with an efficient power-driven tool.

All surfaces must be dry, cool or slightly warm, and free from oil, grease or other foreign matter. Spreading rate is approximately 250-sq.ft. per gallon, this depending upon the type of surface to be painted.

The material is shipped ready for use and should be applied as received; when thinning becomes necessary, use Thur-Ma-Lox special thinner or benzol.

Letters from I. F. Readers

(Continued from page 12)

varnish, as well as a heat-resisting paint.

The first inquiry for the acid-resisting air-dry varnish was by "A. Z. Laboratories," and the request for heat-resisting paint was by "N. H. A. Chemical Laboratories" (both on page 4.)

If you would care to supply us with the names and addresses of these inquiries, we would be glad to write them the details of the products which we feel would be of assistance to them, and if they wish we would be glad to submit samples so they could make tests to their own satisfaction. —Frank Bownes Co.

Names and addresses supplied—Ed.

Tilt Tumbling Barrel

In your October 1941 issue, on page 54, you illustrate an adjustible tilt barrel for finishing small work. We made two inquiries about a tilt barrel, but both companies say they are made for polishing metal. What we want is practically the same thing, but for finishing small wood parts. Can you give us information as to where we may purchase same?—N. & T. Co. (Wood Toys & Novelties).

Lining for Pickling Tank

We have a wooden tank 7-ft.4-in. long by 4-ft.4-in. wide by 4-ft.4-in. deep, which will be used for pickling steel. The solution used will be 6% sulfuric acid at 180° to 200°F. We would like to line this tank in order to prolong its life. We would be interested in obtaining information of two types of material:

1) A material that could be applied like paint.

2) Other lining material that could be applied at our plant, such as brick, etc. In this case we would like to keep the lining as thin as is practical.

Do you know of anyone who can furnish such a material?—L. C. Co.

Luminous Paints

In Industrial Finishing for December 1941, you have an article on page 29 concerning Luminous Paints, by Carl W. McNell, Chemist and Metallurgist. Will you kindly give us an address by which we might personally contact the author? We are interested in more technical information on this subject and believe his knowl-

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edge might be of some value. It is urgent that an early contact be made and we would appreciate a prompt reply from you.—S. G. C. (Chief Chemist for Finish Mfr.).

Address furnished.—ED.

In your November 1940 issue you published an article about Luminous Paint. We are interested in contacting a source of supply on luminous paints, pastes or pigments, and will appreciate your giving us a list of a few manufacturers of this material.—B. C. & F.

Refinishing Information

We are interested in the refinishing of furniture and refrigerators, and contemplate adding this service to one we are already doing, that is the cleaning of upholstered furniture. We would appreciate any information and literature that might be available on this work, especially using the present day removers and finishes.—F. P. Co.

No-Blink Starter Switch

We understand that on page 61 of one of the recent issues of INDUSTRIAL FINISHING, reference is made to a new (no-blink) starter switch announced by the Westinghouse Electric & Mfg. Co., for use with fluorescent lamps. Will you please let us know in which issue of INDUSTRIAL FINISHING this starter switch is advertised?—D. M. Co. (Electrical Material and Supplies).

See October, 1941 issue.—ED.

New Air Pump Catalog

A new loose-leaf edition of the Gast rotary air pump and compressor catalog has just been issued by Gast Mfg. Corp., Benton Harbor, Mich. The new catalog contains concise data on the company's augmented line designed to meet especially the needs of Defense production—including the new Gast V-belt driven air pump.

Industrial Finishes, Inc., Started by J. H. Markham

Mr. Jacob H. Marham, well-known in the Grand Rapids area, has established his own business for the manufacture of finishes. The new firm is known as Industrial Finishes, Inc., and occupies a new building at 528 Butterworth St., S. W. Mr. Markham has associated with him as plant manager, Mr. Joseph Tokarz.

Using Shellac Without Alcohol

DUE TO the acute shortage of alcohol, some foreman finishers are eliminating it, as far as possible, from their finishing schedule. This they do by using a common chemical to dewax their shellac, thus making it soluble with water. By using water instead of alcohol with this dewaxed shellac for washcoats, combination stain and washcoats, toners, etc., they are not using very much alcohol.—H. W. CHESTER.

Editor's Note: In order to obtain further information on this subject, we wrote the Shellac Information Bureau, and received the following reply:

I am particularly interested in your letter of December 1st, in which you advised me of information received from one of your foreman-finishers who states that he and other finishers are eliminating the necessity of alcohol as far as posible, "by adding a common chemical to dewax their shellac, thus making it soluble with water and by using water instead of alcohol."

The method to which this particular finishing foreman refers is perfectly reasonable and practical. Although he has not given you the details of his procedure, I am inclined to believe he has misinterpreted the actual reaction that takes place, as I do not know of any procedure to be followed that "dewaxes the shellac."

By the addition of 4-oz. of amonia to one gallon of 5-lb. white liquid shellac, the shellac in this alcoholic liquid solution is rendered sufficiently soluble so that 2½ to 3 gallons of water can be safely added to the mixture, thus giving a resultant three to four gallons of

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Industrial Division

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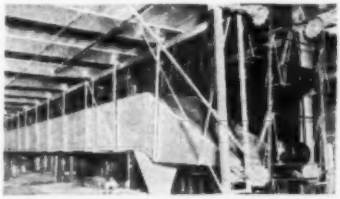

This is a Despatch conveyor type oven used for baking finish on oil drums.

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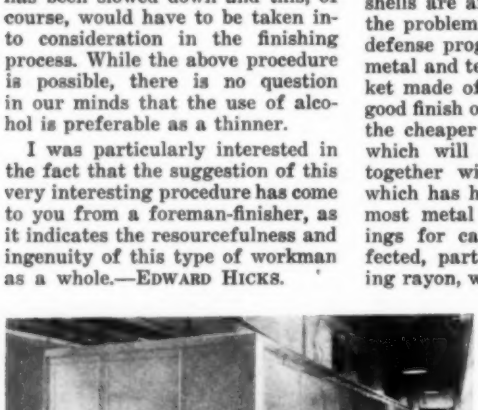
varnish. This varnish is, of course, suitable for washcoats, combination stain and washcoats, toners, etc.

The only disadvantage would be the effect that its drying quality has been slowed down and this, of course, would have to be taken into consideration in the finishing process. While the above procedure is possible, there is no question in our minds that the use of alcohol is preferable as a thinner.

I was particularly interested in the fact that the suggestion of this very interesting procedure has come to you from a foreman-finisher, as it indicates the resourcefulness and ingenuity of this type of workman as a whole.—EDWARD HICKS.

Mahogany Finish on Cypress Casket Shells

CASKET manufacturers may soon find that finished cypress shells are an easy way to sidestep the problems brought about by the defense program, with its attendant metal and textile shortages. A casket made of clear cypress, with a good finish on it, may even supplant the cheaper class of steel caskets, which will probably be hard hit together with the metallic finish which has heretofore been used on most metal caskets. Cloth coverings for caskets will also be affected, particularly those containing rayon, wool or silk.



In connection with the ovens and heating equipment for baking enamel on metal cabinets—also, the spray booths and air supply system for same—square removable air-filter units are used as shown here to filter incoming air for the spray booths. Removable filters are products of the American Air Filter Co., Inc. Photograph, courtesy of Drying Systems, Inc.

Cypress, which is the wood of a southern evergreen, has a grain figure similar to fir plywood. It is too soft for most cabinet or construction work, and for this reason will probably continue to be available during this critical period. Its softness however makes it easy to work and turn out the intricate joints and moldings used in casket manufacture.

* * *

In this shop the crevices and nail holes are patched and then the shell is sanded smooth with No. 180 Cutrite paper. The shell is then dusted carefully and wiped with mahogany uniforming stain. This will leave a smooth even tone of red, since the dark sections of wood are harder than the lighter sections and therefore will not absorb as much stain.

No filler is necessary, since there is no open grain to fill.

The remainder of the finishing is very simple—a coat of lacquer sealer followed two hours later by a quick sanding and a coat of synthetic varnish. This final varnish coat may be either dull or glossy, according to the type of finish desired.

Instead of mahogany, a nice job can be obtained by using a light maple stain, or American walnut. Shading can also be added, or gold striping.

For a quick finish, lacquer can be used instead of varnish, but it does not give as nice a finish owing to the porosity of the wood.

The cost of this finish will not run any higher than that of a good cloth covering—probably less. With a little experimenting a finisher can turn out a job that compares favorably with all the beauty of the more expensive hardwoods.—AL. MATLOCK.

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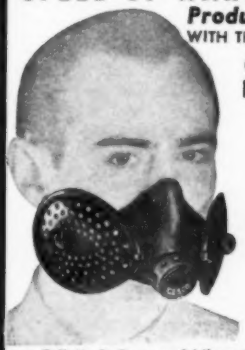

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Industrial FINISHING

Distributed monthly to finishing room and paint shop foremen, production superintendents and company officials of metalworking, woodworking and miscellaneous industrial plants where production finishing is a major operation in parts and products manufacture.

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Editorial

Spray Painting New Military Aircraft

The following paragraphs are excerpts from a letter of Dec. 8, 1941, by a man who was formerly foreman finisher in a factory producing civilian products. He is now working in the finishing department of a large plant that manufactures military aircraft.—Ed.

I will tell you briefly about how things are worked here. If possible, you can work it into an article and print it under a "nom de plume."

I am working in a unit of the plant that is in production on heavy bombers. There are three finishing departments. The main department is a separate building about 100x400-ft.; the other two are incorporated with the assembly buildings.

Of the two smaller shops, one is for finishing the small parts that require handling and masking. The other is conveyorized for the spraying of small parts and for priming parts that have just come out of the anodyzing department.

The main shop is for spraying larger sections the heaviest of which are carried on a monorail. This building is about 40-ft. high, with heated air coming in through the ceiling so that the room is under pressure.

All equipment is of the latest type, with waterwash spray booths, etc. In the main shop there is one open-faced booth about 40-ft. long, equipped with six pressure containers and operated by four men. In the center of the room is a closed booth for spraying wings which move through lengthwise by an overhead conveyor. About one-third of this building is for spray finishing; one-third is for doping and one-third is for material storage.

The first coat is always a light transparent coat of zinc chromate primer; the next is AP (aluminum primer) — a silver-green coating with more build than the zinc chromate primer.

The final coat is usually flat bronze-green or a light-absorbing flat black; in some cases a camouflage grey. There is no sanding. In fact there is no particular effort made to do what you or I

would call a good finishing job, but the surfaces do have to be well covered, particularly the edges. Runs and dust do not seem to matter. [Evidently the command calls for speed, complete coverage and non-light-reflecting protective coating.—ED.]

I am using a portable outfit up and down the line, spraying the insides of hull sections and other rush parts that can not be sent through regular channels. The work is easy and I like it fine. . . My only regret is that I did not come out here several years ago and get in on the ground floor . . . Our supervisor is a very young man who has been with the company less than two years.

P. S.—All cleaning is by dipping or wiping, using a "brush wash" which appears to be a mixture of acetone and naphtha. This seems to give good adhesion, although I was always under the impression that an acid rinse was necessary on aluminum alloys.

It is now 10 P. M. and I have to arise at 5:45 in order to be on the job at 7:00.

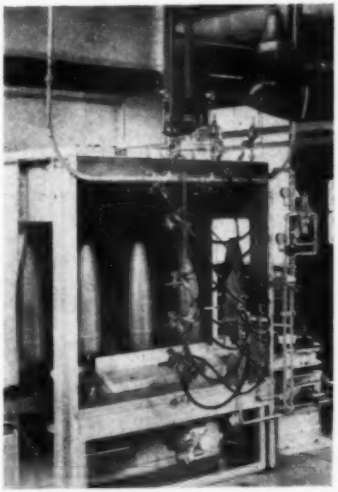
Note: The Japs are not here yet!—ABCD.

Outlook for 1942 in the Industrial Finishing Field

* The industrial finishing industry, like many others, has been thrown off its normal course by the demands of defense production and the operation of priorities on raw materials. However, makers of goods without high priorities have not been prevented from obtaining finishes to meet their needs from manufacturers in position to meet rapidly changing conditions.

These changes involve both the kinds of finishes and the raw materials that are available to producers of non-essentials.

Some of the ingredients commonly used in lacquers and enamels, such as nitrocellulose, certain solvents, many types of pigments, especially whites, synthetic resins of the phenol-formaldehyde, alkyd, and urea-formaldehyde groups, and aluminum powder, can be supplied only in limited quantities, or not at all, for use by the non-essential industries.



Here shells are being sprayed by one of the three automatic machines on the Loading Line. Band shields (flanged metal rings) have been dropped over the rifling bands to keep them free of paint. The flat disc on the nose of each shell is the exposed part of the fuse-thread mask.

* Guest Editorial . . . Many readers can write an excellent editorial — two or three paragraphs that present a timely suggestion or valuable idea which will stimulate real thought on a live subject. The Editor welcomes guest editorials and pays for those that are published.

I personally prefer to believe that the current emergency in our field, as well as in others, will be very well handled by our typical American ingenuity and initiative.—L. A. O.

At the same time, these industries have, in many cases, been forced to make one or more drastic changes in the composition of their products. Thus, certain manufacturers have had to switch from metal to a plastic, and then again to wood, papier-mache, or other material.

Both kinds of changes create new problems for the industrial finishing industry to solve with a minimum loss of time.

The result has been the development of a series of finishes based on castor oil, soya oil, linseed oil, various organic acids, and other substances that are not likely to be limited in supply by either our defense needs or by military operations, as is the case with tung oil and phthalic anhydride. In the hands of formulators with adequate skill, very satisfactory substitute finishes are thus being produced and, in many cases, permanent additions are being made to our list of useful finishes.

Since we are planning to double our defense output in 1942, as compared to 1941, the difficulties of manufacturers without high priorities are bound to increase, but they need have no special concern about the finishing situation, unless events take a totally unexpected turn. Solving special problems has always been the chief business of certain manufacturers of finishes, and this kind of experience is of particular value at this time.

The defense and essential industries are, of course, using finishes of all kinds in large quantities, and not much trouble has been experienced in supplying them.

At this time last year, defense work was being hampered by the fact that the government specifications for finishes were largely obsolete. This situation has been remedied. In fact, the finishing industry is now urging the government to reduce its consumption of the most modern types of finishes wherever possible, so as to permit a large amount to go to non-defense industries.

For the use of the defense industries the heaviest demand is for air-drying and baking alkyd synthetic enamels and air-drying lacquers. Wrinkle enamels are being used for special jobs, such as finishing radio cabinets, telephone panels, and small instruments.

The development of high-speed finishes and the rapid radiant heat baking process has greatly helped to speed up the production of defense products. The finishing room need never be a bottle-neck in any important industry.—G. KLINKENSTEIN, Maas & Waldstein Co.

Facing Facts About Available Materials for Finishing

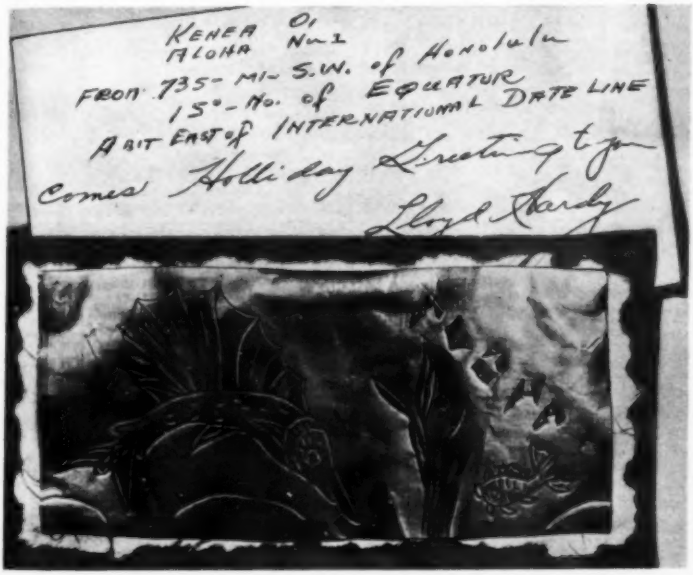
* Being the arsenal of democracy and the world's policeman—to say nothing of feeding and clothing a cold hungry world—has made Uncle Sam's big family "conservation conscious." To share our possessions with the rest of the world has, to say the least, reduced individual portions. Regardless of opinions, Interventionists or Isolationists, the consequences at the moment, are the same.

Finishing material manufacturers are confronted with problems that call for prompt, definite ac-

tion to provide their customers with protective coatings. Like the historic invitation for lunch given by the hostess who stated that if she had some ham she would serve ham and eggs, if she could get the eggs, we would like to give you the same lacquers and sealers if we could get the same products we used in making them. However, necessity has always been the Mother of Invention and we have taken up the task. Judging by progress and products as shown to date, the challenge has been met by most wide-awake manufacturers.

It is not unlikely that, as raw materials continue to become less and less available, the ultimate protective coating may become less "protective" to say nothing of its "coating" properties. Up to this point however, most of us have marveled at what can be accomplished without so many of the materials formerly considered absolute essentials. It is fortunate that many of us don't know exactly what is being "substituted for our substitutes."

At times it may not pay to ask too many questions, so long as we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THE EDITOR'S MOST UNUSUAL CHRISTMAS GREETING

Much more attractive than it appears here, this thin coppered-paneled red folder shows flying fish in the Pacific, in iridescent green, red, blue and purple—a very difficult color scheme to photograph. It came from G. L. Hardy who has written articles for I. F. He is working on one of the Pacific Island defense projects at or near Johnson Island, T. H. The envelope bears the postmark Honolulu, Hawaii, December 11, and has a 24-cent airmail stamp. It was opened, resealed and marked "Released by I. C. B. 48."

have confidence in our source, but this is indeed a poor time to deal with "new letter heads" designed for the occasion. This reminds us of a recent argument brought forth to support the contention that if our house was on fire we wouldn't question the man who rushed to our aid—but, if we recognized him as a known arsonist, we might at least ask him if he started the fire.

Too many big-hearted firms have recently come into being, apparently for the sole purpose of saving us in the emergency, by accumulating stocks of essential materials. There has been some "tongue in cheek" comment that certain questionable producers would for a sizable premium, permit some of their products to be sold through some new but "well named" companies—certain commodities which through normal channels would be governed by strict priorities and price ceilings. Fortunately such methods are not encountered in dealings with reputable established firms, and it is our opinion that by far the greatest percentage of business today is transacted in conformity with a code of ethics entirely commendable.

Basically sound judgment will prompt suppliers and consumers to adhere very closely to established connections, wherein the storms, regardless of how severe, can best be weathered through mutual understanding on the part of each, for the problems of the other.

Without question, much good will come from the efforts now being directed toward overcoming emergency obstacles and, in our opinion, we will emerge from the chaos, wiser though probably poorer financially, yet richer in having met and conquered every obstacle, and maintained our liberty and Democracy.—V. J. DOLAN.

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Speeded-up Tempo in Defense; More One-Coat Finishes

• The thought that strikes me most forcibly, at this time, is the speeded-up tempo, not only in defense work but in everything else. Seems as if we just have to be in one great big hurry about everything we do.

Fast moving defense work has drawn along with it fast moving everything; and that very movement has more than influenced all kinds of finishing.

Because Mr. Average Citizen is working on something that Uncle Sam wants right away, everything that Mr. Citizen wants for himself, he puts the same demand on. "Please ship immediately," is the salutatory phrase on almost every order received. Certainly it has exercised an influence on finishes. Men in the finishing business scurry about endeavoring to meet the demands, and they are doing it.

We in the factories are working hard at this game. Americans, you know, are prone to make a game out of the hardest kind of defense work—a game to beat Hitler and Japan.

There is another phrase that we hear almost constantly. "One-coat job." It has been hurled at us for months now. The demand has been so persistant that there are a number of finishes of that class to be had at present. You might say that defense speed is responsible for speed in non-defense products —responsible in two ways; first, to do the job quickly; second, because there is little time available in which to do it.

One of the fast one-coat jobs, very popular at this time, is the wrinkle finish. It is fast, durable and pleasing to the eye. It has the admirable quality of doing away with all undercoats and hiding all defects without any attention being given to them whatever. It is principally used on metal products. All that is necessary is to have the metal clean before application. A variety of wrinkle patterns is possible even by using the same product. Skill in the application of this finish is what makes this variety possible.

In the defense finishes, speed is also demanded. Primers must dry in an hour or less and finish coats in three to four hours. For army work, the finish coat must be a non-light-reflecting job. There must be no glare or gloss to any weapon finished for use by the army. Army weapons of all classes have nothing on them that is bright; nothing that will reflect light.

It is the same old story. Create the demand for anything, it seems, and these Yankees will make it. Certainly, the finishers are doing their part in finishing defense implements so that they have low visibility. "Low Visability and High Efficiency!" Not a bad slogan for defense weapons, is it?—W. K. PERDUE.

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M. & E. Mfg. Co.

FILLERS: WOOD

Advance Paint Co.
Berry Brothers
M. L. Campbell Co.
The Clinton Co.
James B. Day & Co.
V. J. Dolan & Co., Inc.
E. I. duPont deNemours & Co., Inc.
The Egyptian Lacquer Mfg. Co.
Finishine Laboratories, Inc.
The Glidden Co.
Grand Rapids Wood Finishing Co.
Hilo Varnish Corp.
Lilly Varnish Co.
Maas & Waldstein Co.
Martin Varnish Co.
Pittsburgh Plate Glass Co.
Randolph Finishing Products Co.
Reliance Varnish Co.
Rockford Varnish Co.
The Schaefer Varnish Co.
Stanley Chemical Co.
Standard Industrial Products, Inc.
Southern Varnish Corp.
Stille-Young Corp.
Varnish Products Co.
The Watson-Standard Co.
Yarnall Paint Co.

FILTERS: SPRAY BOOTH

American Air Filter Co., Inc.

FLOCKS: COTTON, WOOL, RAYON

Claremont Waste Mfg. Co.
V. J. Dolan & Co., Inc.
Maas & Waldstein Co.
Rayon Processing Co. of R. I.
Rockford Varnish Co.
Zapon Division, Atlas Powder Co.

GRAINING EQUIPMENT

American Richwood Products Co.
Binks Mfg. Co.
Graining Roller Co.
Hansman Studio
George Koch Sons, Inc.
Reliance Varnish Co.
Standard Industrial Products, Inc.
The Watson-Standard Co.

HAND CREAMS: PROTECTIVE

DeVilbiss Co.
Doster & Co.
Mine Safety Appliances Co.

HOSE

Binks Mfg. Co.
Crown Spray Gun Mfg. Co.
The DeVilbiss Co.
M. & E. Mfg. Co.

INFRA-RED-RAY EQUIPMENT

North American Elec. Lamp Co.
Op-Al Elec. & Mfg. Co.

KNIFE HEATERS

M. L. Campbell Co.
Op-Al Elec. & Mfg. Co.

LACQUERS

Advance Paint Co.
Berry Brothers
Bristol Lacquer & Chemical Co.
M. L. Campbell Co.
The Clinton Co.
James B. Day & Co.
V. J. Dolan & Co., Inc.
E. I. duPont deNemours & Co., Inc.
Duralac Chemical Corp.
The Egyptian Lacquer Mfg. Co.
Finishine Laboratories, Inc.
The Forbes Varnish Co.
The Glidden Co.
Grand Rapids Wood Finishing Co.
Hilo Varnish Corp.
Lilly Varnish Co.
Maas & Waldstein Co.
Martin Varnish Co.
Pittsburgh Plate Glass Co.
Randolph Finishing Products Co.
Reliance Varnish Co.
Rockford Varnish Co.
Roxalin Flexible Lacquer Co.
Rudd Lacquer Corp.
Monroe Sander Corp.
The Schaefer Varnish Co.
Speed-O-Lag Products Co.
Standard Industrial Products, Inc.
Southern Varnish Corp.
The Stanley Chemical Co.
Stille-Young Corp.
United Lacquer Mfg. Corp.
Varnish Products Co.
V. E. P. Company
H. V. Walker Co.
The Watson-Standard Co.
Zapon Division, Atlas Powder Co.

LACQUER HEATING EQUIPMENT

Binks Mfg. Co.
The DeVilbiss Co.

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V. J. Dolan & Co., Inc.
Finishine Laboratories, Inc.
Grand Rapids Wood Finishing Co.
Rockford Varnish Co.
Roxalin Flexible Lacquer Co.
Universal Shellac Stick Co.

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MASKS: CANISTER & HOSE
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Mine Safety Appliances Co.
Pulmosan Safety Equip. Corp.

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M. L. Campbell Co.
Finishine Laboratories, Inc.
Grand Rapids Wood Finishing Co.
Industrial Tape Corp.
Minnesota Mining & Mfg. Co.
The Watson-Standard Co.

MATERIAL PUMPS
Binks Mfg. Co.
The DeVilbiss Co.

METAL CLEANERS
E. I. duPont deNemours & Co., Inc. (R. & H. Chemicals Dept.)
The Enthone Co.
Finishine Laboratories, Inc.
Rockford Varnish Co.
Stille-Young Corp.

METAL WASHING MACHINES
R. C. Mahon Co.

MIXERS: FLUID & LIQUID
The DeVilbiss Co.
Eclipse Air Brush Co.
Mixing Equipment Co., Inc.

OVENS: BAKING, DRYING
Despatch Oven Co.
Ferro Enamel Corp.
George Koch Sons, Inc.
The R. C. Mahon Co.

PEARL ESSENCE
V. J. Dolan & Co., Inc.
Mearl Corp.

POLISHING COMPOUNDS
Advance Paint Co.
V. J. Dolan & Co., Inc.
E. I. duPont deNemours & Co., Inc.
The Enthone Co.
The Glidden Co.
Grand Rapids Wood Finishing Co.
Lea Mfg. Co.
Minnesota Mining & Mfg. Co.
Rockford Varnish Co.
Southern Varnish Corp.
Standard Industrial Products, Inc.
L. R. van Allen Co.

POLISHING EQUIPMENT
Finishine Laboratories, Inc.
Lea Mfg. Co.

PRIMERS
Advance Paint Co.
Berry Brothers
Bristol Lacquer & Chemical Co.
M. L. Campbell Co.
The Clinton Co.
James B. Day & Co.
V. J. Dolan & Co.
E. I. duPont deNemours & Co.
Duralac Chemical Corp.
The Egyptian Lacquer Mfg. Co.
The Forbes Varnish Co.
The Glidden Co.
Hilo Varnish Corp.
Lilly Varnish Co.
Maas & Waldstein
Martin Varnish Co.
Perfection Paint & Color Co.
Pittsburgh Plate Glass Co.
Randolph Finishing Products Co.
Reliance Varnish Co.
Rockford Varnish Co.
Roxalin Flexible Lacquer Co.
Monroe Sander Corp.
The Schaefer Varnish Co.
Southern Varnish Corp.
Speed-O-Laq Products Co.
Standard Industrial Products, Inc.
The Stanley Chemical Co.
Stille-Young Corp.
United Lacquer Mfg. Corp.
V. E. P. Company
H. V. Walker Co.
The Watson-Standard Co.
Yarnall Paint Co.
Zapon Division, Atlas Powder Co.

PUMPS: MATERIAL
Binks Mfg. Co.
DeVilbiss Co.

RESPIRATORS: PAINT & DUST
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Crown Spray Gun Mfg. Co.
Binks Mfg. Co.

DeVilbiss Mfg. Co.
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Mine Safety Appliances Co.
Pulmosan Safety Equip. Corp.

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Reliance Varnish Co.

RUBBING MACHINES

Detroit Surfacing Mach. Co.
Sterling Tool Products Co.
Sunstrand Machine Tool Co.

RUST PROOFING PROCESSES

The Enthone Co.
George Koch Sons, Inc.
The R. C. Mahon Co.
Watson-Standard Co.

SANDING MACHINES

Detroit Surfacing Mach. Co.
Sterling Tool Products Co.
Sunstrand Machine Tool Co.

SEALERS: WOOD

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Berry Brothers
Bristol Lacquer & Chemical Co.
M. L. Campbell Co.
The Clinton Co.
James B. Day & Co.
V. J. Dolan & Co., Inc.
E. I. duPont deNemours & Co.
Duralac Chemical Corp.
The Egyptian Lacquer Mfg. Co.
Finishine Laboratories, Inc.
The Forbes Varnish Co.
The Glidden Co.
Grand Rapids Wood Finishing Co.
Hilo Varnish Corp.
Lilly Varnish Co.
Maas & Waldstein Co.
Martin Varnish Co.
Minnesota Mining & Mfg. Co.

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Pittsburgh Plate Glass Co.
Randolph Finishing Products Co.
Reliance Varnish Co.
Rockford Varnish Co.
Roxalin Flexible Lacquer Co.
Rudd Lacquer Corp.
Monroe Sander Corp.
The Schaefer Varnish Co.
Speed-O-Lac Products Co.
Standard Industrial Products, Inc.
The Stanley Chemical Co.
Southern Varnish Corp.
Stille-Young Corp.
United Lacquer Mfg. Corp.
Varnish Products Co.
H. V. Walker Co.
The Watson-Standard Co.
Yarnall Paint Co.
Zapon Division, Atlas Powder Co.

SHELLAC

Advance Paint Co.
Berry Brothers
M. L. Campbell Co.
The Clinton Co.
James B. Day & Co.
Finishine Laboratories, Inc.
The Glidden Co.
Grand Rapids Wood Finishing Co.
Hilo Varnish Corp.
Pittsburgh Plate Glass Co.
Rockford Varnish Co.
Rudd Lacquer Corp.
Southern Varnish Corp.
Stille-Young Corp.
The Watson-Standard Co.
Yarnall Paint Co.

SHELLAC STICKS

M. L. Campbell Co.
James B. Day & Co.
V. J. Dolan & Co., Inc.
Finishine Laboratories, Inc.
Grand Rapids Wood Finishing Co.
Rockford Varnish Co.
Stille-Young Corp.
Universal Shellac Stick Co.

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This soft cream, applied to the hands, arms, neck or face, dries in a minute to a thin, tough, invisible film which keeps paints, lacquers, enamels, inks, varnish, dirt, grease or grime from touching the skin. Removed with warm water, leaving the skin soft, smooth and clean. Industrial and finishing plants everywhere try it—then repeat in increasing quantities. Ask for liberal test on firm letterhead.

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Carbon Filament Lamps, service proven, available in Inside-Silvered (self-reflecting) or in Clear Glass types. Write for details.

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STAINS
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M. L. Campbell Co.
The Clinton Co.
James B. Day & Co.
V. J. Dolan & Co., Inc.
E. I. duPont deNemours & Co.
The Egyptian Lacquer Mfg. Co.
Finishine Laboratories, Inc.
The Glidden Co.
Grand Rapids Wood Finishing Co.
Hilo Varnish Corp.
Lilly Varnish Co.
Maas & Waldstein Co.
Martin Varnish Co.
Perfection Paint & Color Co.
Pittsburgh Plate Glass Co.
Randolph Finishing Products Co.
Reliance Varnish Co.
Rockford Varnish Co.
Rudd Lacquer Corp.
The Schaefer Varnish Co.
Stille-Young Corp.
Southern Varnish Corp.
Varnish Products Co.
The Watson-Standard Co.
Yarnall Paint Co.
Zapon Division, Atlas Powder Co.

STENCILS: SILK SCREEN and PHOTOGRAPHIC
American Richwood Products Co.
Hansman Studio
Photo-Stencil Engraving Co.
Rayon Processing Co. of R. I.
Reliance Varnish Co.

STRIPING TOOLS
The DeVilbiss Co.
Finishine Laboratories, Inc.
M. & E. Mfg. Co.

STRIPPERS: BAKED ENAMEL
The Enthone Co.
Lea Mfg. Co.

SOLVENTS AND THINNERS
Advance Paint Co.
Berry Brothers
Bristol Lacquer & Chemical Co.
M. L. Campbell Co.
The Clinton Co.
James B. Day & Co.
V. J. Dolan & Co., Inc.
E. I. duPont deNemours & Co.
Duralac Chemical Corp.
Hammond Chemical Service
The Egyptian Lacquer Mfg. Co.
The Glidden Co.
Hilo Varnish Corp.
Lilly Varnish Co.
Maas & Waldstein Co.
Monroe Sander Corp.
Pittsburgh Plate Glass Co.
Randolph Finishing Products Co.
Reliance Varnish Co.
Rockford Varnish Co.
Roxalin Flexible Lacquer Co.
Rudd Lacquer Corp.
Solvents Recovery Service, Inc.
Speed-O-Laq Products Co.
Standard Industrial Products, Inc.
The Stanley Chemical Co.
Stille-Young Corp.
United Lacquer Mfg. Corp.
H. V. Walker Co.
The Watson-Standard Co.
Yarnall Paint Co.
Zapon Division, Atlas Powder Co.

SPRAY PAINTING EQUIPMENT
American Air Filter Co.
Binks Mfg. Co.
M. L. Campbell Co.
Crown Spray Gun Mfg. Co.
The DeVilbiss Co.
Finishine Laboratories, Inc.
Industrial Tape Corp.
The R. C. Mahon Co.
M. & E. Mfg. Co.
The Alex. Millburn Co.

STICK SHELLAC
M. L. Campbell Co.
James B. Day & Co.
V. J. Dolan & Co., Inc.
Finishine Laboratories, Inc.
Grand Rapids Wood Finishing Co.
Rockford Varnish Co.
Stille-Young Corp.
Universal Shellac Stick Co.

SYNTHETICS

Advance Paint Co.
Berry Brothers
Bristol Lacquer & Chemical Co.
M. L. Campbell Co.
The Clinton Co.
James B. Day & Co.
V. J. Dolan & Co.,Inc.
Duralac Chemical Corp.
E. I. duPont deNemours & Co.
The Egyptian Lacquer Mfg. Co.
Ferro Enamel Corp.
Finishine Laboratories, Inc.
The Forbes Varnish Co.
Hilo Varnish Corp.
Lilly Varnish Co.
Maas & Waldstein Co.
Martin Varnish Co.
Perfection Paint & Color Co.
Pittsburgh Plate Glass Co.
Randolph Finishing Products Co.
Reliance Varnish Co.
Rockford Varnish Co.
Roxalin Flexible Lacquer Co.
Rudd Lacquer Corp.
Monroe Sander Corp.
The Schaefer Varnish Co.
Southern Varnish Corp.
Speed-O-Laq Products Co.
Standard Industrial Products, Inc.
The Stanley Chemical Co.
Stille-Young Corp.
United Lacquer Mfg. Corp.
Varnish Products Co.
V. E. P. Company
H. V. Walker Co.
Yarnall Paint Co.
Zapon Division, Atlas Powder Co.

VARNISHES

Advance Paint Co.
Berry Brothers
M. L. Campbell Co.
The Clinton Co.
E. I. duPont deNemours & Co.
Duralac Chemical Corp.
The Egyptian Lacquer Mfg. Co.
Finishine Laboratories, Inc.
The Forbes Varnish Co.
The Glidden Co.
Grand Rapids Wood Finishing Co.
Hilo Varnish Corp.
Keystone Varnish Co.
Lilly Varnish Co.
Maas & Waldstein Co.
Martin Varnish Co.
Pittsburgh Plate Glass Co.
Perfection Paint & Color Co.
Reliance Varnish Co.
Rockford Varnish Co.
Monroe Sander Corp.
The Schaefer Varnish Co.
Southern Varnish Corp.
Speed-O-Laq Products Co.
Stille-Young Corp.
Standard Industrial Products, Inc.
Thresher Varnish Co.
Varnish Products Co.
V. E. P. Company
H. V. Walker Co.
The Watson-Standard Co.
Yarnall Paint Co.
Zapon Division—Atlas Powder Co.

WASHERS: METAL

R. C. Mahon Co.

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American Richwood Products Co.
Reliance Varnish Co.

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The perfect Lacquer Burning-in Cement. Will not raise or soften and is not affected by any type of lacquer.

LARGEST LINE OF COLORS

Write for Color Card, showing both Lacquer and Shellac Stick Colors and for the name of nearest distributor.

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Rate: 45 cents per line per insertion—minimum $1.35

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Let established Midwest manufacturer supply materials for your unfilled orders. Ample supplies of Industrial Lacquers and Enamels. Highest quality materials. Reply will be held in strictest confidence. Address IF-877, care Industrial Finishing.

REPRESENTATIVE WANTED

Experienced industrial paint salesman with following in metropolitan New York territory. Advertiser is nationally known, has complete line of industrial paints, varnishes, lacquers and enamels, also New York branch warehouse. Territory open has established business. Applicants should use company application form. For application form, address IF-876, care Industrial Finishing.

FOR SALE

CHEAP—One J. H. Day Paint Mill, three 15" Mills in one gang, New Stones, also large quantity of Dry Colors. Address BRADFORD & CO., INC., Drawer 150, St. Joseph, Mich.

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Even if you have nothing to sell at this time, don't stop advertising. Now is the time to do more of it. Keep your name before your customers' eyes, as they will be reading Industrial Finishing for all the news on the paint industry they can get, and waiting for something new.

One manufacturer of machine tools was asked why he advertised when he knew he didn't have it to sell. His reply was that his company was spending more on advertising in the trade magazines this year than ever before. They are putting out a bigger and better catalog than ever before. In this way their customers will know they are still in business and their name and product will be foremost in the customers' minds when they will be able to sell to them again.—Russell Davis.

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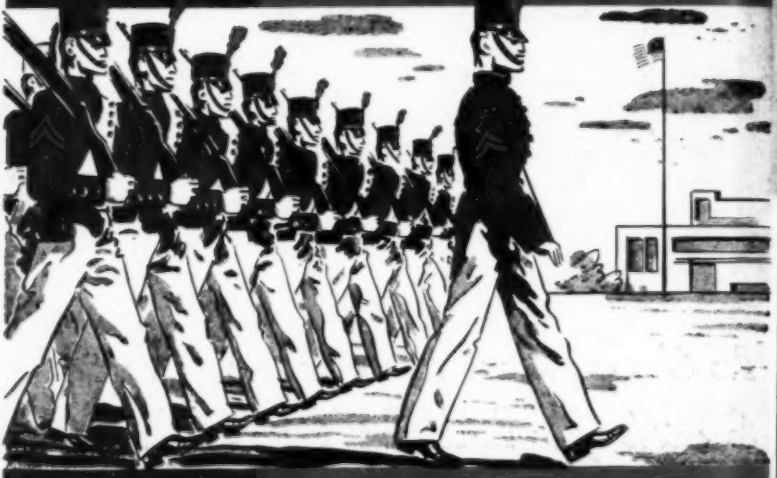
This year we're taking time out to wish for you and all of us a ***Safe*** **NEW YEAR** . . . one that will see America still safe from its enemies. To this end we pledge our loyal support knowing that we can count on you, our friends and customers, to do the same.

ADVANCE PAINT COMPANY

Manufacturers of Wood & Metal Finishing Materials

INDIANAPOLIS, INDIANA

UNIFORMITY



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LACQUERS
VARNISHES
SYNTHETIC FILLERS
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UNDERCOATS
PAINTS • ENAMELS
WIPE-RITE STAINS
SPRAY-RITE STAINS

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From start to finish . . . every step in the manufacture of Southern Varnish Corporation products is controlled with scientific precision. Result: Southern Varnish Corporation finishes are always dependable and UNIFORM.

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